

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION**

PROGME CORPORATION
208 Clair Hill Drive
Rochester Hills, MI 48309,

Plaintiff

v.

COMCAST CABLE COMMUNICATIONS, LLC
1701 JFK Boulevard
Philadelphia, Pennsylvania 19103

NBCUNIVERSAL MEDIA, LLC
30 Rockefeller Plaza
New York, NY 10112,

Defendants

Civil Action No. 2:15-cv-13935

District Judge Stephen J. Murphy, III

Magistrate Judge Michael J.
Hluchaniuk

JURY TRIAL DEMANDED

**FIRST AMENDED COMPLAINT
FOR PATENT INFRINGEMENT**

Plaintiff Progme Corporation (“Progme”) files this **FIRST AMENDED COMPLAINT FOR PATENT INFRINGEMENT** against Defendant **COMCAST CABLE COMMUNICATIONS, LLC** (“Comcast”) and Defendant **NBCUNIVERSAL MEDIA, LLC** (“NBCU”) for infringement of U.S. Patent No. 8,713,425 (“’425 Patent”). A copy of the ’425 Patent is attached as **Exhibit A**.

THE PARTIES

1. Progme is a corporation existing under the laws of Michigan with its principal place of business at 208 Clair Hill Drive, Rochester Hills, MI 48309.
2. On information and belief, Defendant Comcast is a limited liability company existing under the laws of Delaware with its principal place of business at 1701 JFK Boulevard, Philadelphia, Pennsylvania 19103. Defendant Comcast Cable Communications, LLC is a wholly owned subsidiary and operating unit of Comcast Corporation. Comcast Cable

Communications, LLC can be served with process through its registered agent Comcast Capital Corporation at 1201 N. Market Street, Suite 1000, Wilmington, Delaware 19801.

3. On information and belief, Defendant NBCU is a limited liability company existing under the laws of Delaware with its principal place of business at 30 Rockefeller Plaza, New York, New York 10112-0015. The sole member and sole owner of NBCUniversal Media, LLC is NBCUniversal, LLC, a holding company and a limited liability company organized under the laws of the state of Delaware with its principal place of business at 30 Rockefeller Plaza, New York, New York 10112-0015. NBCUniversal Media, LLC is a wholly owned subsidiary and operating unit of Comcast Corporation. NBCUniversal Media, LLC can be served with process through its registered agent The Corporation Trust Company at Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801.

COMCAST'S ACQUISITION OF NBCU

4. The Federal Communications Commission approved Defendant Comcast's acquisition of Defendant NBCU in FCC MB Dkt. 10-56. In its order approving the acquisition, the FCC imposed certain conditions regarding programming and program signals representative of predetermined program material to be transmitted by respective means for transmitting program signals of Defendant Comcast and Defendant NBCU (hereinafter termed "programming conditions").
5. The relevance of said programming conditions to the instant Amended Complaint is that it highlights the legal/regulatory necessity of Defendant Comcast to direct and control Defendant NBCU's means for transmitting program signals representative of predetermined program material to ensure compliance with said programming conditions.

6. In its Order approving Defendant Comcast's acquisition of Defendant NBCU and specifying said programming conditions, the FCC defined "C-NBCU Programmer" to mean Defendant Comcast, Defendants Comcast and NBCU combined, their affiliates and any entity for which Defendant Comcast or Defendants Comcast and NBCU combined manages or controls the licensing of video programming and/or any local broadcast television station on whose behalf Defendant Comcast or Defendant NBCU negotiates retransmission consent.
7. Said programming conditions generally require Defendant Comcast to indiscriminately provide access to its programming including programming of the acquired Defendant NBCU ("comparable programming") to competitors, to protect the development of online competition, to provide indiscriminate competitor access to Defendant Comcast's including the acquired Defendant NBCU's distribution facilities and to protect diversity and local concerns.
8. In its Order approving Defendant Comcast's acquisition of Defendant NBCU and specifying said programming conditions, the FCC defined "comparable programming" to mean video programming that is reasonably similar in kind and amount and, for purposes of determining whether video programming constitutes comparable programming, the parties and an arbitrator shall consider i) the number of channels and/or shows and ii) the similarity of value of the video programming as evidenced by ratings, affiliate fees and/or advertising revenues and the time elapsed since the programming was first distributed.
9. In its Order approving Defendant Comcast's acquisition of Defendant NBCU and specifying said programming conditions, the FCC defined the following categories of video programming as not comparable in terms of said programming conditions:

i) programming made available for presentation a day or more after it is first presented to viewers is not comparable to programming made available for presentation the first day; ii) sports programming is not comparable to non-sports programming; iii) local news programming is not comparable to programming that is not local news programming; iv) prior season programming is not comparable to originals, first-run programming; v) broadcast programming is not comparable to cable programming; vi) childrens (12 years or younger) programming is not comparable to non-children programming; vii) films are not comparable to non-film programming and viii) films less than 5 years from initial theatrical distribution are not comparable to films over 5 years from initial theatrical distribution.

10. Said programming conditions further provided for U.S. Department of Justice enforcement and arbitration means to resolve any licensing dispute that may arise between the combined Defendants Comcast and NBCU and an online video distributor.
11. Said programming conditions were to remain in effect for seven (7) years and remain in effect at present and during all times relevant to the instant Amended Complaint.

JOINDER

12. Joinder of Defendants Comcast and NBCU is proper under 35 U.S.C. § 299 because, as alleged in **COUNT I-VI**, Defendants Comcast and NBCU are liable for patent infringement arising out of the same series of transactions or occurrences related to the use of the same method and questions of fact common to both Defendants will arise in the action.

13. Further, numerous rights to relief are asserted against Defendants Comcast and NBCU jointly, severally, or in the alternative with respect to or arising out of the same transaction, occurrence, or series of transactions or occurrences relating to the making, using, importing into the United States, offering to sell or selling of the same accused method and/or process.
14. Said joint, several or alternative liability between Defendants Comcast and NBCU arises primarily due to Defendant Comcast directing and controlling, as a direct infringer, the activities infringing the '425 patent including the infringing activities committed by Defendant NBCU.
15. Indeed, said programming conditions require Defendant Comcast to direct and control certain activities performed by Defendant NBCU to avoid Defendant Comcast and/or Defendant NBCU from violating any one or more of said programming conditions.
16. Said programming conditions require Defendant Comcast to direct and control certain activities performed by Defendant NBCU which infringe said '425 Patent.
17. Said certain activities performed by Defendant NBCU directed and controlled by Defendant Comcast include transmitting via means for transmitting program signals program signals representative of predetermined program material in conjunction with program-related data comprising print() or println() statements of the PrintWriter method.
18. Said certain activities performed by Defendant NBCU directed and controlled by Defendant Comcast further include encoding said program signals representative of predetermined program material to transmit said print() or println() statements of the PrintWriter method in conjunction with transmission of program signals representative of predetermined program material.

JURISDICTION AND VENUE

19. This is an action for patent infringement arising under the Patent Laws of the United States, 35 U.S.C. § 1, et seq. including 35 U.S.C. § 271.
20. Subject matter jurisdiction is proper in this Court pursuant to 28 U.S.C. §§ 1331 and 1338(a).
21. Venue in this judicial district is proper under 28 U.S.C. §§ 1391 including 28 U.S.C. § 1391 (b) and (c) and 28 U.S.C. §§ 1400(b).
22. This Court has personal jurisdiction over Defendants Comcast and NBCU. These Defendants regularly conduct and transact business in and within this judicial district itself and through one or more subsidiaries, affiliates, partners or other related parties and have committed and continue to commit acts of patent infringement in this judicial district.
23. Defendants Comcast and NBCU engage in persistent courses of conduct and derive substantial revenue from products and/or services provided to individuals in this judicial district, purposefully establishing substantial, systematic, and continuous contacts within this judicial district to reasonably expect to be haled into court here and/or to be subjected to Michigan's long arm statute within this judicial district.
24. In addition, venue is proper because Defendants Comcast and NBCU, respectively, provide cable and broadcast television service to people within this judicial district.
25. On information and belief, Defendant Comcast currently makes available for live streaming to people within this judicial district the following programming services: BBC World News; beIn Sports and beIn ~ Sports; Disney including Disney Channel, Disney Junior, Disney XD, FX and FXX; ESPN including ESPN, ESPN2, ESPN3, ESPNNews, ESPN Deportes and ESPNU; Fox including Fox News, Fox Business, Fox Sports 1 and

Big Ten Network; Nat Geo including National Geographic Channel and Nat Geo Wild; NBC Sports Live Extra, NBC Sports Talk Radio, Universal Sports, NHL Network; NBCUniversal including CNBC, MSNBC, Golf Channel, Esquire TV, E!, Sprout, USA Network, Syfy, Oxygen, Bravo, Mun2 and Deportes Telemundo en Vivo; A&E Networks including A&E and History Channel; Scripps including HGTV, Food Network, Cooking Channel, Travel Channel and DIY Network; Turner Broadcasting including CNN, HLN and truTV and Starz.

26. On information and belief, Defendant NBCU currently makes available for live streaming to people in this judicial district the following programming services: CNBC, MSNBC, NBC Sports, NBC Sports Radio, Golf Channel, Universal Sports Network, Esquire TV, E!, Sprout, USA Network, Syfy, Oxygen, Bravo and Deportes Telemundo en Vivo.
27. Further, another basis for venue in this judicial district against Defendants Comcast and NBCU is based on contact with and operation of a certain cloud-based data center hosted by Amazon Web Services (AWS) within this judicial district.
28. Specifically, venue is proper against Defendant Comcast based on its operation and/or use of a data center, “365 CLOUD STORAGE”, hosted by AWS within this judicial district, DT1 Data Center at 24660 Lahser Road, Southfield, MI 48034.
29. Said DT1 Data Center is one of several data centers operated by AWS connecting major cities across the U.S. in an integrated, redundant and fault-tolerant AWS cloud network wherein if one of said data centers, such as one located outside of Michigan, fails then another data center, such as the DT1 Data Center within this judicial district, takes over and provides cloud processing and transmission services on behalf of said failed data center in an integrated, redundant, fault-tolerant and “geo-caching” architecture.

30. Venue is also proper against Defendant NBCU based on its operation and/or use of at least one data center in said AWS cloud network and consequential use of the DT1 Data Center in this judicial district for cloud-based processing and transmission in said integrated, redundant, fault-tolerant and “geo-caching” architecture.

U.S. PATENT 8,713,425

31. On April 29, 2014, the U.S. Patent and Trademark Office duly and legally issued U.S. Patent No. 8,713,425 (“the ’425 Patent”), entitled “AUDIO/VIDEO PROGRAM-RELATED HYPERLINK PRINTER”, to Progme assignee after a full and fair examination.
32. As indicated in the appended **Exhibit B**, Progme became the owner of all rights, title and interest in and to the ’425 Patent by recorded assignment and possesses all rights of recovery under the ’425 Patent, including the right to sue and recover damages for all infringements. Since the date of said assignment, Progme has been and remains the sole owner of said rights, title and interest in and to the ’425 Patent.
33. The ’425 Patent discloses and claims, in part, a method for generating an hyperlink address string structured as a PrintWriter method, the hyperlink address string addressed to a resource in the initial array position of a list in which resource identifiers uniquely identifying resources corresponding to predetermined program material are arrayed, for transmission in conjunction with program signals representative of predetermined program material. See the ’425 Patent at pg. 17, cols 37-39.
34. The ’425 Patent further discloses and claims, in part, a predetermined hyperlink address to predetermined hyperlinked content comprising a resource identifier to identify i) a resource from resources of threads performed in a Java Virtual Machine (JVM) and ii) an

application, in which certain thread objects belong or a resource consumer related to the resource belongs, executed in said JVM; a resource consumer for each thread using a resource in said JVM; a resource manager to manage resource usage wherein said resource identifier and resource manager are generated using Java language and registered resource managers are stored according to types and a resource allocation policy comprising calling a resource identifier that is in an initial array position of a list in which resource identifiers uniquely identifying resources are arrayed or requesting an initial resource identifier that is first on an array in a resource identifiers list. See the '425 Patent at pg. 21, cols. 6-10, 12-14, 17-19, 26-38, 42-44, 50-52 and 59-63.

35. After disclosing that said resource identifier is in said initial array position or said initial resource identifier is first on an array in a resource identifiers list, the '425 Patent discloses that said resource identifier identifies a request for dynamically generated information from a selected or specified servlet object of a plurality of instantiated servlet objects wherein said request is mapped by a thread designated to handle said request. See the '425 Patent at pg. 22, cols 1-56.

36. It is well known by those skilled in the art that an URL pattern registered in a web.xml table maps a request for dynamically generated information from a selected or specified servlet object of a plurality of instantiated servlet objects to a servlet class designated to handle the request.

37. The '425 Patent is valid and enforceable.

**COUNT I: DEFENDANTS COMCAST AND NBCU
INFRINGEMENT OF U.S. PATENT 8,713,425**

38. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.

39. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.
40. Defendants Comcast and NBCU deploy individually named servlets in their respective cable television networks, services and transmission systems, each servlet defined by certain Java code “open-sourced” at github.com. See <https://github.com>.
41. Said certain Java code comprises Comcast Message Bus or Cloud Message Bus code (hereinafter termed “CMB code”).
42. Said individually named servlets include: CNSControllerServlet of the com.comcast.cns.controller.CNSControllerServlet servlet-class having url pattern / servlet mapping, CNSControllerServlet of the com.comcast.cns.controller.CNSControllerServlet servlet-class having a /CNS/* url-pattern servlet-mapping, CQSControllerServlet of the com.comcast.cqs.controller.CQSControllerServlet servlet-class having url-pattern / servlet-mapping, EndpointServlet of the com.comcast.cmb.common.controller.EndpointServlet servlet-class having url pattern /Endpoint/* servlet mapping, AdminServlet of the com.comcast.cmb.common.controller.AdminServlet servlet-class having url pattern /webui/* servlet mapping , CMBVisualizerServlet of the com.comcast.cmb.common.controller.CMBVisualizerServlet having url pattern /webui/cmbvisualizer/* servlet mapping, CNSUserPageServlet of the com.comcast.cns.controller.CNSUserPageServlet servlet-class having url pattern

/webui/cnsuser/* servlet mapping, CQSUserPageServlet of the
com.comcast.cqs.controller.CQSUserPageServlet servlet-class having url pattern
/webui/cqsuser/* servlet mapping, UserLoginPageServlet of the
com.comcast.cmb.common.controller.UserLoginPageServlet servlet-class having url
pattern /webui/userlogin/* servlet mapping, UserPageServlet of the
com.comcast.cmb.common.controller.UserPageServlet servlet-class having url pattern
/webui/user/* servlet mapping, CNSSubscriptionPageServlet of the
com.comcast.cns.controller.CNSSubscriptionPageServlet servlet-class having url pattern
webui/cnsuser/subscription/* servlet-mapping, CNSPublishToTopicPageServlet of the
com.comcast.cns.controller.CNSPublishToTopicPageServlet servlet-class having url
pattern /webui/cnsuser/publish/* servlet-mapping, CNSEditTopicDisplayNamePage of
the com.comcast.cns.controller.CNSEditTopicDisplayNamePage servlet-class having url
pattern /webui/cnsuser/editdisplayname/* servlet mapping,
CNSEditTopicDeliveryPolicyPage of the
com.comcast.cns.controller.CNSEditTopicDeliveryPolicyPage servlet-class having url
pattern /webui/cnsuser/editdeliverypolicy/* servlet mapping,
CNSEditSubscriptionDeliveryPolicyPage of the
com.comcast.cns.controller.CNSEditSubscriptionDeliveryPolicyPage servlet class having
url pattern /webui/cnsuser/subscription/editdeliverypolicy/* servlet mapping,
CNSRawMessageDeliveryPolicyPage of the
com.comcast.cns.controller.CNSRawMessageDeliveryPolicyPage servlet class having url
pattern /webui/cnsuser/subscription/rawmessagedeliverypolicy/* servlet mapping,
CNSTopicPermissionPage of the com.comcast.cns.controller.CNSTopicPermissionPage

servlet class having url pattern /webui/cnsuser/permission/*,
 CNSTopicAddPermissionPage of the
 com.comcast.cns.controller.CNSTopicAddPermissionPage servlet class having url
 pattern /webui/cnsuser/addpermission/* servlet mapping,
 CQSQueueMessagesPageServlet of the
 com.comcast.cqs.controller.CQSQueueMessagesPageServlet servlet class having url
 pattern /webui/cqsuser/message/* servlet mapping, CQSAddQueuePermissionPage of the
 com.comcast.cqs.controller.CQSAddQueuePermissionPage servlet class having url
 pattern /webui/cqsuser/addpermission/* servlet mapping, CQSQueuePermissionsPage of
 the com.comcast.cqs.controller.CQSQueuePermissionsPage servlet class having url
 pattern /webui/cqsuser/permissions/* servlet mapping, CNSWorkerStatePageServlet of
 the com.comcast.cns.controller.CNSWorkerStatePageServlet servlet class having url
 pattern /webui/cnsworkerstate/* servlet mapping, CQSAPIStatePageServlet of the
 com.comcast.cqs.controller.CQSAPIStatePageServlet servlet class having url pattern
 /webui/cqsapistate/* servlet mapping, CQSEditQueueAttributePage of the
 com.comcast.cqs.controller.CQSEditQueueAttributePage servlet class having url pattern
 /webui/cqsuser/editqueueattributes/* servlet mapping and CMBStatsServlet of the
 com.comcast.cmb.common.controller.CMBStatsServlet servlet class having url pattern
 /webui/cmbcallstats/* servlet mapping.

See <https://github.com/Comcast/cmb/blob/master/config/WEB-INF-CNS/web.xml>,
<https://github.com/Comcast/cmb/blob/master/config/WEB-INF-CQS/web.xml> and
<https://github.com/Comcast/cmb/blob/master/WebContent/WEB-INF/web.xml>.

43. Mapping a selected or specified instantiated servlet object is accomplished via matching a given servlet URL pattern contained in a request for dynamically generated information from a selected or specified servlet object to a servlet class designated to handle the request.
44. Several of said individually named servlets include Java code comprising at least one print() or println() statement of the PrintWriter method specifying an URL pattern (specified below) mapping a request for dynamically generated information to the servlet class designated to handle the request wherein said URL pattern is defined within said at least one print() or println() statement.
45. Said individually named servlets comprise a set of instantiated servlet objects, one of which may be selected or specified by a web browser device to hyperlink to for printing to a device screen predetermined printable output of said selected or specified servlet object via a PrintWriter available for the servlet to use.
46. Said selected or specified servlet object comprises a servlet object in the initial array position of said set of instantiated servlet objects or a first servlet object in an array of instantiated servlet objects.
47. Said selected or specified servlet object of said set of instantiated servlet objects generates dynamically generated information via said PrintWriter available for servlet use.
48. Said dynamically generated information generated by said selected or specified servlet object comprises print() or println() statements of a PrintWriter method.
49. Through said selected or specified servlet object generating said print() or println() statements of a PrintWriter method, Defendant Comcast generates dynamically generated information via said statements contained in said CMB code.

50. By generating said print() or println() statements of a PrintWriter method contained in said CMB code, Defendant Comcast directly infringes the '425 Patent.
51. Said dynamically generated information generated from said selected or specified servlet object comprises AWS cloud network usage monitoring information such as performance and advertising metrics, web statistics and cost control information.
52. Said dynamically generated information generated from said selected or specified servlet object comprises cloud-based predetermined program material represented by program signals representative of said predetermined program material.
53. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have committed and continue to commit acts of infringement of the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by marketing, leasing and/or selling a transmission service for transmitting and encoding program-related signals including said PrintWriter hyperlink address string in conjunction with program signals representative of predetermined program material.
54. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by using "Request and Response parameters included in the one or more predetermined parameters defining the pre-defined printable output of the predetermined hyperlinked content included in the second attribute in the hyperlink address string [to] ... encapsulate the data sent by the client, thereby allowing servlets to

report status information such as error”. See the ’425 Patent at pg. 14, cols. 62-67 – pg. 15, col. 1.

55. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the ’425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by using servlet hyperlinking and PrintWriter printing to generate dynamically generated information comprising “servlet-specific configuration data at initialization time ... [allowing] different instances of the same servlet class to be initialized with different data, and be managed as differently named servlets ... [wherein the] data provided at initialization time includes an area where each instance keeps its persistent instance-specific state ”. See the ’425 Patent at pg. 15, cols. 15-20.
56. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the ’425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by using servlet hyperlinking and PrintWriter printing to generate dynamically generated information comprising “arguments to an instantiated HttpServlet object through the [Java programming language] properties object” as “a set of ‘name:value’ pairs ... [for] the system administrator ... [to] ‘customize’ an HttpServlet for a particular server at a particular site ... [to] pass the Httpservlet object site specific information about the network location of a database which stores documents that will be requested by client processors across the network or the amount of memory available in system buffers which will be used for processing the server administrator”. See the ’425 Patent at pg. 17, cols. 58-67 – pg. 18, cols. 1-3.

57. Via a selected or specified instantiated servlet object, Defendant Comcast generates print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU.
58. Defendant Comcast's generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU directly infringes the '425 Patent.
59. By generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU, Defendant Comcast directs and controls certain program signal transmission and encoding activities of Defendant NBCU that infringe the '425 Patent.
60. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CMBStatsServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement having a out parameter of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:


```

1) out.println("<p><img
    src='/webui/cmbvisualizer/responsetimeimg?rs="+rs+"></p>");

2) out.println("<h2 align='left'>Redis Response Time Percentiles</h2>");
    out.println("<p><img
    src='/webui/cmbvisualizer/responsetimeimg?redis=true'></p>");

3) out.println("<h2 align='left'>Cassandra Response Time Percentiles</h2>");
    out.println("<p><img
    src='/webui/cmbvisualizer/responsetimeimg?cassandra=true'></p>");

4) out.println("<p><img
    src='/webui/cmbvisualizer/responsetimeimg?ac="+ac+"></p>");

5) out.println("<h2 align='left'>API Call Mix</h2>");
    out.println("<p><img src='/webui/cmbvisualizer/callcountimg'></p>"); and

6) out.println("<h2 align='left'>API Call Distribution</h2>");
    out.println("<p><img src='/webui/cmbvisualizer/calldistributionimg'></p>");.

```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cmb/common/controller/CMBStatsServlet.java>.

61. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said AdminServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the

PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

```
1) out.print("<form action=\"/webui\" method=POST>");
2) out.println("<form action=\"/" +response.encodeURL("webui")+\" method=POST>");
3) out.println("<td><a
href='/webui/cnsuser?userId="+user.getUserId()+">CNS</a></td>"); and
4) out.println("<td><a
href='/webui/cqsuser?userId="+user.getUserId()+">CQS</a></td>");.
```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cmb/common/controller/AdminServlet.java>.

62. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said AdminServletBase generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

- 1) out.println("All Users" + " | ");
- 2) out.println(""+user.getUserName()+"'s
Topics" + " | ");
- 3) out.println(""+user.getUserName()+"'s
Queues" + " | ");
- 4) out.println(""+mainUser.getUserName(
)+"'s Topics" + " | ");
- 5) out.println(""+mainUser.getUserName(
)+"'s Queues" + " | ");
- 6) out.println("CNS Dashboard" + " | ");
- 7) out.println("CQS Dashboard" + " | ");
- 8) out.println("Stats" + " | ");
- 9) out.println("
Topics" + " | ");
- 10) out.println("
Queues" + " | "); and
- 11) out.println("logout</td></tr></table>");.

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cmb/common/controller/AdminServletBase.java>.

63. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CQSQueuePermissionsPage generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

```
1) out.print("<form
action=\"/webui/cqsuser/permissions/?userId="+user.getUserId()+"&queueUrl="+queue
Url+"\" method=POST>");
2) out.println("<p><a href="
onclick=\"window.open('/webui/cqsuser/addpermission/?queueName="+ queueName +
"&userId="+userId+"', 'AddQueuePermission',
'location=0,menubar=0,scrollbars=0,status=0,titlebar=0,toolbar=0,height=470,width=730'
)>Add permission</a></p>");
3) out.println("<h5 style='text-align:center;'><a href='/webui'>ADMIN HOME</a>");
and
```

```
4) out.println("<a href='/webui/cqsuser?userId="+userId+">BACK TO  
QUEUE</a></h5>");
```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cqs/controller/CQSQueuePermissionsPage.java>.

64. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CQSUserPageServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

- 1) out.println("<tr><form action='\"/webui/cqsuser?userId="+user.getUserId() + "\"
method=POST>");
- 2) out.println("<tr><form action='\"/webui/cqsuser?userId="+user.getUserId() + "\"
method=POST>");
- 3) out.println("<tr><form action='\"/webui/cqsuser?userId="+user.getUserId() + "\" " +
"method=POST><td><input type='hidden' name='userId' value='\""+ userId + "\"/>");
- 4) out.println("<tr><form action='\"/webui/cqsuser?userId="+user.getUserId() + "\" " +
"method=POST><td><input type='hidden' name='userId' value='\""+ userId + "\"/>");

```

5) out.println("<td><a href='/webui/cqsuser/message?userId="+ user.getUserId()+
    "&queueName="+ Util.getNameForAbsoluteQueueUrl(queueUrls.get(i)) +
    "">Messages</a></td>");

6) out.println("<td><a href='/webui/cqsuser/permissions?userId="+ user.getUserId() +
    "&queueName="+ Util.getNameForAbsoluteQueueUrl(queueUrls.get(i)) +
    "">Permissions</a></td>");

7) out.println("<td><a href="
    onclick=\"window.open('/webui/cqsuser/editqueueattributes?queueName="+
    Util.getNameForAbsoluteQueueUrl(queueUrls.get(i)) + "&userId="+userId+"\",
    'EditQueueAttributes', 'height=630,width=580,toolbar=no')\">Attributes</a></td>");

and

8) out.println("<h5 style='text-align:center;'><a href='/webui'>ADMIN
    HOME</a></h5>");.

```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cqs/controller/CQSUserPageServlet.java>.

65. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSWorkerStatePageServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraph, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for

dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

1) out.println("<td>Stats</td>");.

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSWorkerStatePageServlet.java>.

66. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSTopicPermissionPage generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

1) out.println("<form

action=\"/\webui/cnsuser/permission/?userId="+user.getUserId()+"&topicArn="+topicArn+"\" method=POST>");

2) out.println("<p><a href="

onclick=\"window.open('/webui/cnsuser/addpermission/?topicArn=" + topicArn +

"&topicName=" + Util.getNameFromTopicArn(topicArn) + "&userId=" + userId + ",

```
'AddTopicPermission',
'location=0,menubar=0,scrollbars=0,status=0,titlebar=0,toolbar=0,height=470,width=
730')\">Add permission</a></p>");
3) out.println("<h5 style='text-align:center;'><a href='/webui'>ADMIN HOME</a>");
and
4) out.println("<a
href='/webui/cnsuser?userId="+userId+"&topicArn="+topicArn+">BACK TO
TOPIC</a></h5>");.
```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSTopicPermissionPage.java>.

67. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSSubscriptionPageServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

- 1) out.println("<form

action=\\\"/webui/cnsuser/subscription/?userId="+userId+"&topicArn="+topicArn+"\\\"
method=POST>");
- 2) out.println("<form

action=\\\"/webui/cnsuser/subscription/?userId="+user.getUserId()+"&arn="+s.getSubscriptionArn()+"&topicArn="+topicArn+"\\\" method=POST>");
- 3) out.println("<td>"+s.getEndpoint()+"</td>");
- 4) out.println("<td>"+s.getEndpoint()+"</td>");
- 5) out.println("<td><a href='#'

onclick=\\\"window.open('/webui/cnsuser/subscription/editdeliverypolicy?subscription

Arn="+ s.getSubscriptionArn() + "&userId=" + userId + "', 'EditDeliveryPolicy',

'height=630,width=580,toolbar=no')\\\">View/Edit Delivery Policy</td>");
- 6) out.println("<td><a href='#' onclick=\\\"window.open('\" + url + \"',

'RawMessageDelivery', 'height=200,width=580,toolbar=no')\\\">Raw Message

Delivery</td>");
- 7) out.println("<p><a

href='/webui/cnsuser/subscription/?userId="+userId+"&topicArn="+topicArn+"&nex

tToken="+response.encodeURL(listSubscriptionsByTopicResult.getNextToken())+"\"

>next ></p>");
- 8) out.println("<h5 style='text-align:center;'>ADMIN HOME");

and

```
9) out.println("<a
href='/webui/cnsuser?userId="+userId+"&topicArn="+topicArn+">BACK TO
TOPIC</a></h5>");
```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSSubscriptionPageServlet.java>.

68. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CQSQueueMessagesPageServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

```
1) out.println("<form id='frm1'
action=\"/webui/cqsuser/message/?userId="+userId+"&queueName="+queueName+"
\" method=POST>");
2) out.println("<form id='frm2'
action=\"/webui/cqsuser/message/?userId="+userId+"&queueName="+queueName+"
\" method=POST>");
```

- 3) out.println("<form id='formsendmessage'
 action=\"/\webui/cqsuser/message/?userId="+userId+"&queueName="+queueName+"
 \" method=POST>");
- 4) out.println("<td><form
 action=\"/\webui/cqsuser/message/?userId="+user.getUserId()+"&queueName="+que
 ueName+"&receiptHandle="+receivedMessage.getReceiptHandle()+"\"
 method=POST><input type='submit' value='Delete' name='Delete'/><input
 type='hidden' name='queueUrl' value='"+ queueUrl+ "' /></form></td></tr>");
- 5) out.println("<a style='float:left;'
 href='/webui/cqsuser/message/?userId="+user.getUserId()+"&queueName="+queueN
 ame+"&nextHandle="+previousHandle+"\">Prev");
- 6) out.println("<a style='float:left;'
 href='/webui/cqsuser/message/?userId="+user.getUserId()+"&queueName="+queueN
 ame+"&nextHandle="+previousHandle+"\">Prev");
- 7) out.println("<a style='float:right;'
 href='/webui/cqsuser/message/?userId="+user.getUserId()+"&queueName="+queueN
 ame+"&prevHandle="+nextHandle+"\">Next");
- 8) out.println("<h5 style='text-align:center;'>ADMIN HOME");
 and
- 9) out.println("BACK TO
 QUEUE</h5>");.

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cqs/controller/CQSQueueMessagesPageServlet.java>.

69. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CQSAddQueuePermissionPage generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraph, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

```
1) out.println("<form
    action=\"/webui/cqsuser/addpermission/?queueName="+queueName+"\"
    method=POST>");.
```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cqs/controller/CQSAddQueuePermissionPage.java>.

70. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSUserPageServlet generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement

of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

- 1) out.println("<form action=\"/"webui/cnsuser?userId=" + userId + "\" " +
"method=POST>");
- 2) out.println("<form action=\"/"webui/cnsuser?userId=" + userId + "\" " +
"method=POST>");
- 3) out.println("<form action=\"/"webui/cnsuser?userId="+userId+"\" method=POST>");
- 4) out.println("<td><a href=" "
onclick=\"window.open('/"webui/cnsuser/editdisplayname?topicArn="+
t.getTopicArn() + "&userId="+userId+"', 'EditDisplayName',
'height=300,width=700,toolbar=no')\">"+(attributes.get("DisplayName") == null ?
"{unset}" : attributes.get("DisplayName"))+"</td>");
- 5) out.println("<td><a href='/"webui/cnsuser/subscription?userId="+ userId +
"&topicArn=" + t.getTopicArn() + "'>Subscriptions</td>");
- 6) out.println("<td><a href='/"webui/cnsuser/publish?userId="+ userId + "&topicArn="+
t.getTopicArn() + "' target='_blank'>Publish</td>");
- 7) out.println("<td><a href=" "
onclick=\"window.open('/"webui/cnsuser/editdeliverypolicy?topicArn="+
t.getTopicArn() + "&userId="+userId+"', 'EditDeliveryPolicy',
'height=630,width=580,toolbar=no')\">View/Edit Topic Delivery Policy</td>");

```

8) out.println("<td><a href='/webui/cnsuser/permission?topicArn="+ t.getTopicArn() +
   "&userId="+ userId + "'>Permission</a></td>");

9) out.println("<p><a
   href='/webui/cnsuser?userId="+userId+"&nextToken="+response.encodeURL(listTo
   picResult.getNextToken())+"'>next&nbsp;&gt;</a></p>"); and

10) out.println("<h5 style='text-align:center;'><a href='/webui'>ADMIN
   HOME</a></h5>");.

```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSUserPageServlet.java>.

71. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSEditTopicDisplayNamePage generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraph, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

```

1) out.println("<form
   action=\"'/webui/cnsuser/editdisplayname?topicArn="+topicArn+"\"
   method=POST>");.

```

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSEditTopicDisplayNamePage.java>.

72. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said CNSRawMessageDeliveryPolicyPage generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraph, defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information wherein said URL pattern defined within said print() or println() statement maps to a servlet class designated to handle the request for dynamically generated information:

1) out.println("<form
 action=\"/webui/cnsuser/subscription/rawmessagedeliverypolicy?subscriptionArn="+
 subArn+"\" method=POST>");.

See <https://github.com/Comcast/cmb/blob/master/src/com/comcast/cns/controller/CNSRawMessageDeliveryPolicyPage.java>.

COUNT II: DEFENDANTS COMCAST AND NBCU INFRINGEMENT OF U.S. PATENT 8,713,425

73. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.

74. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now

infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.

75. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by encoding and transmitting said PrintWriter hyperlink address string in conjunction with program signals representative of predetermined program material.
76. By generating said print() or println() statements of a PrintWriter method contained in said CMB code, Defendant Comcast directly infringes the '425 Patent.
77. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have committed and continue to commit acts of infringement of the '425 Patent by marketing, leasing and/or selling a transmission service for transmitting and encoding program-related signals including said PrintWriter hyperlink address string in conjunction with program signals representative of predetermined program material.
78. Said predetermined printable output of said resource (selected or specified servlet object) in said initial array position printed via the PrintWriter includes AWS cloud network usage monitoring information such as performance and advertising metrics, web statistics and cost control information.
79. Said predetermined printable output of said resource (selected or specified servlet object) in said initial array position printed via the PrintWriter includes cloud-based

predetermined program material represented by program signals representative of predetermined program material.

80. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems commit the following acts of infringement of the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement: generating and transmitting in conjunction with program signals representative of predetermined program material a PrintWriter Hyperlink Address String defining within a print() or println() statement of the PrintWriter method an URL pattern associated with a request for dynamically generated information.

COUNT III: DEFENDANTS COMCAST AND NBCU

INFRINGEMENT OF U.S. PATENT 8,713,425

81. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.
82. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.
83. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have committed and continue to commit acts of infringement of the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by marketing, leasing and/or selling a transmission service for transmitting and encoding program-related signals including said

PrintWriter hyperlink address string in conjunction with program signals representative of predetermined program material.

84. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by public class HConfig generating and transmitting in conjunction with program signals representative of predetermined program material PrintWriter statements having a out parameter for generating dynamically generated information regarding a given HAVi screen display or composition.
85. Via said public class HConfig, Defendant Comcast generates print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely monitor, control and debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU.
86. Defendant Comcast's generating said print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely monitor, control and debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU directly infringes the '425 Patent.
87. By generating said print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely monitor, control and debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU, Defendant Comcast directs and controls certain program signal transmission and encoding activities of Defendant NBCU that infringe the '425 Patent.

88. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems commit the following acts of infringement of the '425 Patent including claims 1, 2, 3, 4, 5, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said public class HConfig generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method predetermined information to be dynamically generated:

- 1) out.println("Found " + screens.length + " screens...");
- 2) out.println("Screen[" + i + "] " + screens[i]);
- 3) out.println("The default screen is screen[" + idx + "]");
- 4) out.println("Background[" + i + "]");
- 5) out.println("Video[" + i + "]");
- 6) out.println("Graphics[" + i + "]");
- 7) out.println(indent + port);
- 8) out.println(indent + TAB + "type = " + portType(port));
- 9) out.println(indent + TAB + "enabled = " + port.status());
- 10) out.println(indent + TAB + "hdcp = " +
port.queryCapability(VideoOutputPort.CAPABILITY_TYPE_HDCP));
- 11) out.println(indent + TAB + "dtcp = " +
port.queryCapability(VideoOutputPort.CAPABILITY_TYPE_DTCP));
- 12) out.println(indent + TAB + "restriction = " +
port.queryCapability(VideoOutputPort.CAPABILITY_TYPE_RESOLUTION_

```

        RESTRICTION));

13) out.println(indent + "BackgroundDevice[" + i + "] " + bg[i]);

14) out.println(indent + "The default bg device is BackgroundDevice[" + idx + "]");

15) out.println(indent + "VideoDevice[" + i + "] " + video[i]);

16) out.println(indent + "The default video device is VideoDevice[" + idx + "]");

17) out.println(indent + "GraphicsDevice[" + i + "] " + gfx[i]);

18) out.println(indent + "The default gfx device is GraphicsDevice[" + idx + "]");

19) out.println(indent + "id = " + device.getIDstring());

20) out.println(indent + "aspect ratio = " + aspectRatio(device.getScreenAspectRatio()));

21) out.println(indent + "The " + name + " config is config[" + idx + "]");

22) out.println(indent + "BG Config[" + i + "] " + configs[i]);

23) out.println(indent + "Video Config[" + i + "] " + configs[i]);

24) out.println(indent + "Gfx Config[" + i + "] " + configs[i]);

25) out.println(indent + "flickerFilter = " + config.getFlickerFilter());

26) out.println(indent + "interlaced = " + config.getInterlaced());

27) out.println(indent + "pixel aspect ratio = " +
        aspectRatio(config.getPixelAspectRatio()));

28) out.println(indent + "resolution = " + resolution(config.getPixelResolution()));

29) out.println(indent + "screenArea = " + area(config.getScreenArea()));

30) out.println(indent + "color = " + bgConfig.getColor()); and

31) out.println(indent + "still = supported");.

```

See https://community.cablelabs.com/svn/OCAPRI/trunk/ri/RI_Stack/apps/config/org/cablelabs/xlet/config/HConfig.java.

COUNT IV: DEFENDANTS COMCAST AND NBCU

INFRINGEMENT OF U.S. PATENT 8,713,425

89. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.
90. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.
91. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by a jdwpGen node generating and transmitting in conjunction with program signals representative of predetermined program material said PrintWriter hyperlink address string having a writer parameter structured as a PrintWriter method for remote java debugging.
92. Via said jdwpGen node, Defendant Comcast generates print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU.
93. Defendant Comcast's generating said print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU directly infringes the '425 Patent.

94. By generating said print() or println() statements of the PrintWriter method enabling Defendant Comcast to remotely debug program signals representative of predetermined program material transmitted via means for transmitting program signals by Defendant NBCU, Defendant Comcast directs and controls certain program signal transmission and encoding activities of Defendant NBCU that infringe the '425 Patent.
95. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 6, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said said jdwpGen node generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method predetermined information to be dynamically generated:

AbstractCommandNode

- 1) writer.println("<h5>\" + name +
\" Command (\" + nameNode.value() + \"</h5>");
- 2) writer.print(" "); and
- 3) writer.println(name() + " (\" + nameNode.value() + \"");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AbstractCommandNode.java?pv=20423.

AbstractGroupNode

- 1) writer.println("void write(PacketStream ps) {");

- 2) writer.print(" a" + name());
- 3) writer.println(writeLabel + ".write(ps);"); and
- 4) writer.println("(vm, ps);");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AbstractGroupNode.java?p=20423.

AbstractNamedNode

- 1) writer.println("<h4>" + name +
" Command Set</h4>");
- 2) writer.print("class " + javaClassName());
- 3) writer.println(javaClassImplements() + " {"); and
- 4) writer.println("#define " + context.whereC + " " + nodeName.value());.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AbstractNamedNode.java?p=20423.

AbstractTypeListNode

- 1) writer.println("<dt>" + name() + " Data");
- 2) writer.println(className + "(VirtualMachineImpl vm, PacketStream ps) {");
- 3) writer.println(className + "(" + javaParams() + ") {"); and
- 4) writer.println("this." + tn.name() + " = " + tn.name() + ";");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AbstractTypeListNode.java?p=20423.

AbstractTypeNode

- 1) writer.println("<td colspan=" + (maxStructIndent - structIndent) + ">");
- 2) writer.println(docType() + "<td><i>" + name() + "</i><td>" + comment() + " "); and
- 3) writer.print(" " + name);.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AbstractTypeNode.java?p=20423.

AltNode

- 1) writer.println("<td colspan=" + (maxStructIndent - structIndent + 1) + ">");
- 2) writer.println("Case " + nameNode.name + " - if <i>" + ((SelectNode)parent).typeName.name + "</i> is " + nameNode.value() + ":",);
- 3) writer.print("static final " + select.typeNode.javaType());
- 4) writer.println(" ALT_ID = " + nameNode.value() + ":",);
- 5) writer.println(select.typeNode.javaParam() + "() {");
- 6) writer.println("return ALT_ID;");
- 7) writer.println("case " + nameNode.value() + ":",);
- 8) writer.println(common + " = new " + name + "(vm, ps);");
- 9) writer.print("static " + select.name() + " create(");
- 10) writer.print(javaParams());
- 11) writer.print("return new " + select.name() + "(");
- 12) writer.print("ALT_ID, new " + javaClassName() + "("); and
- 13) writer.print(tn.name());.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/AltNode.java?p=20423.

BooleanTypeNode

1) `writer.println("ps.writeBoolean(" + writeLabel + ");");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/BooleanTypeNode.java?p=20423.

ByteTypeNode

1) `writer.println("ps.writeByte(" + writeLabel + ");");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ByteTypeNode.java?p=20423.

CommandNode

1) `writer.println("static final int COMMAND = " + nameNode.value() + ");");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/CommandNode.java?p=20423.

CommandSetNode

1) `writer.println("<h4>\" + name +`

`\" Command Set (" + nameNode.value() + "</h4>");`

2) `writer.print("");`

3) `writer.println(name() + " Command Set (" + nameNode.value() + ")");`

4) `writer.println("static final int COMMAND_SET = " + nameNode.value() + ");` and

5) `writer.println("private " + name() + "() {} // hide constructor");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/CommandSetNode.java?p=20423.

ConstantNode

- 1) `writer.println("static final int " + name + " = " + nameNode.value() + ";");` and
- 2) `writer.println("<tr><td>" + name + "<td>" + nameNode.value() + "<td>" + comment() + " ");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ConstantNode.java?p=20423.

ConstantSetNode

- 1) `writer.println("<h4>" + name + " Constants</h4>");`
- 2) `writer.println("");`
- 3) `writer.print("");` and
- 4) `writer.println(name() + " Constants");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ConstantSetNode.java?p=20423.

ErrorNode

- 1) `writer.println("<tr><td>" + "" + name + "</td>" + "<td>" + com + " </td></tr>");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ErrorNode.java?p=20423.

ErrorSetNode

1) writer.println("<dt>" + "Error Data");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ErrorSetNode.java?p=20423.

FieldTypeNode

1) writer.println("ps.writeFieldRef(" + writeLabel + ");");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/FieldTypeNode.java?p=20423.

FrameTypeNode

1) writer.println("ps.writeFrameRef(" + writeLabel + ");");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/FrameTypeNode.java?p=20423.

IntTypeNode

1) writer.println("ps.writeInt(" + writeLabel + ");");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/IntTypeNode.java?p=20423.

LocationTypeNode

1) writer.println("ps.writeLocation(" + writeLabel + ");");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/LocationTypeNode.java?p=20423.

LongTypeNode

1) writer.println("ps.writeLong(" + writeLabel + ");");.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/LongTypeNode.java?p=20423.

MethodTypeNode

1) `writer.println("ps.writeMethodRef(" + writeLabel + ");");`.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/MethodTypeNode.java?p=20423.

Node

- 1) `writer.println("if ((ps.vm.traceFlags & VirtualMachineImpl.TRACE_SENDS) != 0) {");`
- 2) `writer.print("ps.vm.printTrace(\"Sending: ");`
- 3) `writer.print(writeLabel + "(" + javaType() + "): \" + ");`
- 4) `writer.println(displayValue + ");");`
- 5) `writer.println("if (vm.traceReceives) {");`
- 6) `writer.print("vm.printReceiveTrace(" + depth + ", \"");`
- 7) `writer.print(readLabel + "(" + javaType() + "): \" + ");`
- 8) `writer.println(displayValue + ");");`

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/Node.java?p=20423.

OutNode

- 1) `writer.print("static " + cmdName + " process(VirtualMachineImpl vm);`
- 2) `writer.print(tn.javaParam());`
- 3) `writer.println("throws JDWPException {");`

```

4) writer.print("PacketStream ps = enqueueCommand(vm");
5) writer.print(tn.name());
6) writer.println("return waitForReply(vm, ps);");
7) writer.print("static PacketStream enqueueCommand(VirtualMachineImpl vm");
8) writer.print(tn.javaParam());
9) writer.println("PacketStream ps = new PacketStream(vm, COMMAND_SET,
    COMMAND);");
10) writer.println("if ((vm.traceFlags & vm.TRACE_SENDS) != 0) {");
11) writer.print("vm.printTrace(\"Sending Command(id=\" + ps.pkt.id + \") ");
12) writer.print(parent.context.whereJava);
13) writer.println("\"+(ps.pkt.flags!=0?"\", FLAGS=\" + ps.pkt.flags:\"\"));");
14) writer.println("ps.send();");
15) writer.println("return ps;");
16) writer.println("static " + cmdName + " waitForReply(VirtualMachineImpl vm, " +
    "PacketStream ps)");
17) writer.println("throws JDWPException {");
18) writer.println("ps.waitForReply();"); and
19) writer.println("return new " + cmdName + "(vm, ps);");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/OutNode.java?p=20423.

ReferenceIDTypeNode

```

1) writer.println("ps.writeClassRef(" + writeLabel + ");");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ReferenceIDTypeNode.java?p=20423.

ReferenceTypeNode

1) writer.println("ps.writeClassRef(" + writeLabel + ".ref());");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ReferenceTypeNode.java?p=20423.

RepeatNode

- 1) writer.println("<td colspan=" + (maxStructIndent - structIndent) + ">");
- 2) writer.println("int<td><i>" + name + "</i><td>" + comment() + " ");
- 3) writer.println("<td colspan=" + (maxStructIndent - structIndent + 2) + ">");
- 4) writer.println("Repeated <i>" + name + "</i> times:");
- 5) writer.println("ps.writeInt(" + writeLabel + ".length);");
- 6) writer.println("for (int i = 0; i < " + writeLabel + ".length; i++) {;");
- 7) writer.println("int " + cntLbl + " = ps.readInt());");
- 8) writer.println(readLabel + " = new " + member.javaType() +
"[" + cntLbl + "];"); and
- 9) writer.println("for (int i = 0; i < " + cntLbl + "; i++) {;");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/RepeatNode.java?p=20423.

ReplyNode

- 1) writer.println("if (vm.traceReceives) {");

- 2) `writer.print("vm.printStackTrace(\"Receiving Command(id=\" + ps.pkt.id + \") \");`
- 3) `writer.print(parent.context.whereJava);`
- 4) `writer.print("(ps.pkt.flags!=0?\", FLAGS=\" + ps.pkt.flags:\"\")); and`
- 5) `writer.print("(ps.pkt.errorCode!=0?\", ERROR CODE=\" +`
`ps.pkt.errorCode:\"\"));.`

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ReplyNode.java?p=20423.

RootNode

- 1) `writer.println("<html><head><title>" + comment() + "</title></head>");`
- 2) `writer.println("package com.sun.tools.jdi;");`
- 3) `writer.println("import com.sun.jdi.*;"); and`
- 4) `writer.println("import java.util.*;");.`

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/RootNode.java?p=20423.

SelectNode

- 1) `writer.println("abstract static class " + commonBaseClass() + " {");`
- 2) `writer.println("abstract void write(PacketStream ps);");`
- 3) `writer.println("abstract " + typeNode.javaParam() + "();");`
- 4) `writer.println(commonBaseClass() + commonVar() + ";");`
- 5) `writer.print(className + "(" + typeNode.javaParam() + ", ");`
- 6) `writer.print(commonBaseClass() + commonVar());`
- 7) `writer.println("this." + typeNode.name() + " = " + typeNode.name() + ";");`
- 8) `writer.println("this." + commonVar() + " = " + commonVar() + ";");`

9) writer.println(commonVar() + ".write(ps);"); and

10) writer.println("switch (" + typeNode.name() + ") {");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/SelectNode.java?p=20423.

StringTypeNode

1) writer.println("ps.writeString(" + writeLabel + ");");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/StringTypeNode.java?p=20423.

UntaggedValueTypeNode

1) writer.println("ps.writeUntaggedValue(" + writeLabel + ");");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/UntaggedValueTypeNode.java?p=20423.

ValueTypeNode

1) writer.println("ps.writeValue(" + writeLabel + ");");

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/ValueTypeNode.java?p=20423.

See https://community.cablelabs.com/svn/OCAPRI/tags/stable_ctp_no_upnp/ri/ODLSrc/OCAP-1.0/jvm/Sun/src/share/tools/jpda/classes/com/sun/tools/jdwpngen/?p=20423.

COUNT V: DEFENDANTS COMCAST AND NBCU

INFRINGEMENT OF U.S. PATENT 8,713,425

96. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.

97. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.
98. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by public class MC generating and transmitting in conjunction with program signals representative of predetermined program material said PrintWriter hyperlink address string having a pw parameter structured as a PrintWriter method for transport stream directory and file tree building.
99. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by marketing, leasing and/or selling transmission and encoding service for transmitting and encoding for transmission in conjunction with program signals representative of predetermined program material said PrintWriter hyperlink address string.
100. Via said public class MC, Defendant Comcast generates print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU.

101. Defendant Comcast's generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU directly infringes the '425 Patent.

102. By generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU, Defendant Comcast directs and controls certain program signal transmission and encoding activities of Defendant NBCU that infringe the '425 Patent.

103. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television networks, services and transmission systems have been and are now infringing the '425 Patent including claims 1, 2, 3, 4, 7, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said public class MC generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method predetermined information to be dynamically generated:

- 1) pw.printMsg("package @ ;", packageName);
- 2) pw.printMsg("public class @ extends LogWrapperBase {", className);
- 3) pw.printMsg("public @(Logger logger)", className);
- 4) pw.println("super(logger) ;");
- 5) pw.printMsg("// Log wrapper class for Sun private system exceptions in group @",
groupNames);

```

6) pw.printMsg("// Generated by MC.java version @, DO NOT EDIT BY HAND!",
    VERSION);

7) pw.printMsg("// Generated from input file @ on @", inFile, new Date());

8) pw.println("import org.omg.CORBA." + e.getName() + " ");

9) pw.println( "private static LogWrapperFactory factory = new LogWrapperFactory()
    {");

10) pw.println( "public LogWrapperBase create( Logger logger )" );

11) pw.printMsg("return new @( logger ) ;", className);

12) pw.printMsg("public static @ get( ORB orb, String logDomain )", className);

13) pw.printMsg( "@ wrapper = ", className);

14) pw.printMsg( "(@) orb.getLogWrapper( logDomain, ", className);

15) pw.printMsg( "\"@\", factory ) ;", groupName);

16) pw.println( "return wrapper ;" );

17) pw.printMsg( "public static @ get( String logDomain )", className);

18) pw.printMsg( "@ wrapper = ", className);

19) pw.printMsg( "(@) ORB.staticGetLogWrapper( logDomain, ", className);

20) pw.printMsg( "\"@\", factory ) ;", groupName);

21) pw.println( "return wrapper ;" );

22) pw.printMsg("// @", e.getName());

23) pw.printMsg("public static final int @ = @ ;", errorName, getBase(groupName,
    code));

24) pw.printMsg( "public @ @( CompletionStatus cs, Throwable t@) {",
    exceptionName, ident, makeDeclArgs(true, numParams));

```

```

25) pw.printMsg( "@ exc = new @( @, cs );", exceptionName, exceptionName,
    errorName);

26) pw.println( "exc.initCause( t );" );

27) pw.printMsg( "if (logger.isLoggable( Level.@ )) {", logLevel);

28) pw.printMsg( "Object[] parameters = new Object[ @ ] ;", numParams);

29) pw.printMsg("parameters[ @ ] = arg@ ;", a, a);

30) pw.println( "Object[] parameters = null ;");

31) pw.printMsg( "doLog( Level.@, \"@.@\",", logLevel, groupName, ident);

32) pw.printMsg( "parameters, @.class, exc ) ;", className);

33) pw.println( "return exc ;");

34) pw.printMsg("public @ @( CompletionStatus cs@) {", exceptionName, ident,
    makeDeclArgs(true, numParams));

35) pw.printMsg("return @( cs, null@ ) ;", ident, makeCallArgs(true, numParams));

36) pw.printMsg("public @ @( Throwable t@) {", exceptionName, ident,
    makeDeclArgs(true, numParams));

37) pw.printMsg("return @( CompletionStatus.COMPLETED_NO, t@ ) ;", ident,
    makeCallArgs(true, numParams));

38) pw.printMsg("public @ @( @) {", exceptionName, ident, makeDeclArgs(false,
    numParams));

39) pw.printMsg("return @( CompletionStatus.COMPLETED_NO, null@ ) ;", ident,
    makeCallArgs(true, numParams)); and

40) pw.printMsg("@.@=\"@: (@) @\"", groupName, ident, getMessageID(groupName,
    exName, c.getCode()), exName, c.getMessage());.

```

See <http://www.docjar.com/html/api/com/sun/tools/corba/se/logutil/MC.java.html>.

COUNT VI: DEFENDANTS COMCAST AND NBCU

INFRINGEMENT OF U.S. PATENT 8,713,425

104. Plaintiff re-alleges paragraphs 1-37 as if fully set forth herein.
105. Defendants Comcast and NBCU, jointly, severally or alternatively in their respective cable television upnp Home Network systems, services and devices, have been and are now infringing, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, the '425 Patent in this judicial district and elsewhere.
106. Defendants Comcast and NBCU, individually, jointly, severally or alternatively in their respective cable television upnp Home Network systems, services and devices, have been and are now infringing the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by an upnp Home Network node generating and transmitting in conjunction with program signals representative of predetermined program material said PrintWriter hyperlink address string structured as a PrintWriter method having a ps (PrintStream) parameter.
107. Defendants Comcast and NBCU, individually, jointly, severally or alternatively in their respective cable television upnp Home Network systems, services and devices, have committed and continue to commit acts of infringement of the '425 Patent, directly and indirectly by way of inducement and/or contributory infringement, by marketing, leasing and/or selling a transmission and encoding service for, respectively, transmitting and encoding program-related signals including said PrintWriter hyperlink address string in conjunction with program signals representative of predetermined program material.

108. Via said upnp Home Network node, Defendant Comcast generates print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU.
109. Defendant Comcast's generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU directly infringes the '425 Patent.
110. By generating said print() or println() statements of the PrintWriter method to be transmitted in conjunction with program signals representative of predetermined program material by Defendant NBCU, Defendant Comcast directs and controls certain program signal transmission and encoding activities of Defendant NBCU that infringe the '425 Patent.
111. Defendants Comcast and NBCU, individually, jointly, severally or alternatively in their respective cable television upnp Home Network systems, services and devices, have been and are now committing the following acts of infringement of the '425 Patent including claims 1, 2, 3, 4, 8, 9, 10, 12, 13, 14, 15, 17, 18, 19, 20, 22, 23 and 24, directly and indirectly by way of inducement and/or contributory infringement, by said upnp Home Network node generating and transmitting in conjunction with program signals representative of predetermined program material code documented in the following numbered sub-paragraphs, defining within a print() or println() statement of the PrintWriter method predetermined information to be dynamically generated:

ContainerNode

- 1) ps.print(" " + ContainerNode.SEARCHABLE + "=\");
- 2) ps.print(XML.escapeXMLChars(getProperties().getProperty(ContainerNode.

```

SEARCHABLE).getPropertyValue() + "\\");

3) ps.print(" " + ContainerNode.CHILDCOUNT + "\\");

4) ps.print(XML.escapeXMLChars( Integer.toString(getReferences().length)) + "\\");

5) ps.print("<" + Node.TITLE + ">");

6) ps.print(getProperties().getProperty(Node.TITLE).getPropertyValue());

7) ps.println("</" + Node.TITLE + ">");

8) ps.print("<" + Node.UPNPCLASS + ">");

9) ps.print(getProperties().getProperty(Node.UPNPCLASS).getPropertyValue());

10) ps.println("</" + Node.UPNPCLASS + ">");

11) ps.print("<" + Node.OCAP_PERMISSION + ">");

12) ps.print(getProperties().getProperty(Node.OCAP_PERMISSION).getPropertyValue());

13) ps.println("</" + Node.OCAP_PERMISSION + ">"); and

14) ps.println("</" + getName() + ">");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/hn_down_merged_via_copy/ri/ODLSrc/OCAP-1.0/java/src/hn/org/cablelabs/impl/ocap/hn/contentdatabase/ContainerNode.java.

ItemNode

```

1) ps.print("<" + ItemNode.DATE + ">");

2) ps.print(date);

3) ps.println("</" + ItemNode.DATE + ">");

4) ps.print("<" + ItemNode.RCILIST + ">");

5) ps.print(rciList);

```

```

6) ps.println("</" + ItemNode.RCILIST + ">");

7) ps.print("<" + ItemNode.RESOURCE);

8) ps.print(" " + ItemNode.PROTOCOLINFO + "=\"");

9) ps.print(getProperties().getProperty(ItemNode.PROTOCOLINFO).

    getPropertyValue() + "\"");

10) ps.print(" " + ItemNode.SIZE + "=\"");

11) ps.print(getProperties().getProperty(ItemNode.SIZE).getPropertyValue() + "\"");

12) ps.print(getProperties().getProperty(ItemNode.URL).getPropertyValue());

13) ps.println("</" + ItemNode.RESOURCE + ">");

14) ps.print("<" + VideoItem.SRSID + ">");

15) ps.print(getProperties().getProperty(VideoItem.SRSID).getPropertyValue());

16) ps.println("</" + VideoItem.SRSID + ">"); and

17) ps.println("</" + getName() + ">");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/hn_down_merged_via_copy/ri/

ODLSrc/OCAP-1.0/java/src/hn/org/cablelabs/impl/ocap/hn/contentdatabase/ItemNode.java.

Node

```

1) ps.print("<" + getName());

2) ps.print(" " + Node.ID + "=\"");

3) ps.print(XML.escapeXMLChars(getProperties().getProperty(Node.ID).getProperty

    Value()) + "\"");

4) ps.print(" " + Node.PARENTID + "=\"");

5) ps.print(XML.escapeXMLChars(getProperties().getProperty(Node.PARENTID).getP

    ropertyValue()) + "\"");

```



```

6) ps.print(" " + Node.RESTRICTED + "=" );
7) ps.print(XML.escapeXMLChars(getProperties().getProperty(Node.RESTRICTED).g
   etPropertyValue()) + "\"");
8) ps.print("<" + Node.TITLE + ">");
9) ps.print(getProperties().getProperty(Node.TITLE).getPropertyValue());
10) ps.println("</" + Node.TITLE + ">");
11) ps.print("<" + Node.UPNPCLASS + ">");
12) ps.print(getProperties().getProperty(Node.UPNPCLASS).getPropertyValue());
13) ps.println("</" + Node.UPNPCLASS + ">");
14) ps.print("<" + Node.OCAP_PERMISSION + ">");
15) ps.print(getProperties().getProperty(Node.OCAP_PERMISSION).
   getPropertyValue());
16) ps.println("</" + Node.OCAP_PERMISSION + ">"); and
17) ps.println("</" + getName() + ">");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/hn_down_merged_via_copy/ri/ODLSrc/OCAP-1.0/java/src/hn/org/cablelabs/impl/ocap/hn/contentdatabase/Node.java.

UPNP Home Network Device, Service & Icon Discovery

```

1) ps.println("deviceType = " + getDeviceType());
2) ps.println("friendlyName = " + getFriendlyName());
3) ps.println("presentationURL = " + getPresentationURL());
4) ps.println("devList = " + devList.size());
5) ps.println("serviceList = " + serviceList.size());
6) ps.println("iconList = " + iconList.size());

```

See <https://github.com/cybergarage/cybergarage-upnp/blob/master/core/src/main/java/org/cybergarage/upnp/Device.java>.

VideoItem

- 1) ps.print("<" + VideoItem.TASKID + ">");
- 2) ps.print(getProperties().getProperty(VideoItem.TASKID).getPropertyValue());
- 3) ps.println("</" + VideoItem.TASKID + ">");
- 4) ps.print("<" + VideoItem.TASK_STATE + ">");
- 5) ps.print(getProperties().getProperty(VideoItem.TASK_STATE).getPropertyValue());
- 6) ps.println("</" + VideoItem.TASK_STATE + ">");
- 7) ps.print("<" + VideoItem.SCHED_START_DATE + ">");
- 8) ps.print(getProperties().getProperty(VideoItem.SCHED_START_DATE).getPropertyValue());
- 9) ps.println("</" + VideoItem.SCHED_START_DATE + ">");
- 10) ps.print("<" + VideoItem.SCHED_DURATION + ">");
- 11) ps.print(getProperties().getProperty(VideoItem.SCHED_DURATION).getPropertyValue());
- 12) ps.print("</" + VideoItem.SCHED_DURATION + ">");
- 13) ps.print("<" + VideoItem.SCHED_CH_ID + ">");
- 14) ps.print(getProperties().getProperty(VideoItem.SCHED_CH_ID).getPropertyValue());
- 15) ps.print("</" + VideoItem.SCHED_CH_ID + ">");
- 16) ps.print("<" + VideoItem.DESTINATION + ">");
- 17) ps.print(getProperties().getProperty(VideoItem.DESTINATION).

```

        getPropertyValue());

18) ps.print("</" + VideoItem.DESTINATION + ">");

19) ps.print("<" + VideoItem.PRI_FLAG + ">");

20) ps.print(getProperties().getProperty(VideoItem.PRI_FLAG).getPropertyValue());

21) ps.print("</" + VideoItem.PRI_FLAG + ">");

22) ps.print("<" + VideoItem.RETEN_PRI + ">");

23) ps.print(getProperties().getProperty(VideoItem.RETEN_PRI).getPropertyValue());

24) ps.print("</" + VideoItem.RETEN_PRI + ">");

25) ps.print("<" + Node.OCAP_PERMISSION + ">");

26) ps.print(getProperties().getProperty(Node.OCAP_PERMISSION).

        getPropertyValue());

27) ps.print("</" + Node.OCAP_PERMISSION + ">");

28) ps.print("<" + VideoItem.ORG_STRING + ">");

29) ps.print(getProperties().getProperty(VideoItem.ORG_STRING).getPropertyValue());

30) ps.print("</" + VideoItem.ORG_STRING + ">");

31) ps.print("<" + VideoItem.APPID + ">");

32) ps.print(getProperties().getProperty(VideoItem.APPID).getPropertyValue());

33) ps.print("</" + VideoItem.APPID + ">");

34) ps.print("<" + VideoItem.ORGID + ">");

35) ps.print(getProperties().getProperty(VideoItem.ORGID).getPropertyValue());

36) ps.print("</" + VideoItem.ORGID + ">");

37) ps.print("<" + VideoItem.SPACE_REQ + ">");

38) ps.print(getProperties().getProperty(VideoItem.SPACE_REQ).getPropertyValue());

```

```

39) ps.print("</" + VideoItem.SPACE_REQ + ">");

40) ps.print("<" + VideoItem.CONTENT_URI + ">");

41) ps.print(getProperties().getProperty(VideoItem.CONTENT_URI).
    getPropertyValue());

42) ps.print("</" + VideoItem.CONTENT_URI + ">");

43) ps.print("<" + VideoItem.MEDIA_PRES_POINT + ">");

44) ps.print(getProperties().getProperty(VideoItem.MEDIA_PRES_POINT).getProperty
    Value());

45) ps.print("</" + VideoItem.MEDIA_PRES_POINT + ">");

46) ps.print("<" + VideoItem.MSO_CONTENT_INDICATOR + ">");

47) ps.print(getProperties().getProperty(VideoItem.MSO_CONTENT_INDICATOR).get
    PropertyValue());

48) ps.print("</" + VideoItem.MSO_CONTENT_INDICATOR + ">");

49) ps.print("<" + VideoItem.EXP_PERIOD + ">");

50) ps.print(getProperties().getProperty(VideoItem.EXP_PERIOD).getPropertyValue());

51) ps.print("</" + VideoItem.EXP_PERIOD + ">");

52) ps.print("<" + VideoItem.MEDIA_STOR_VOL + ">");

53) ps.print(getProperties().getProperty(VideoItem.MEDIA_STOR_VOL).
    getPropertyValue());

54) ps.print("</" + VideoItem.MEDIA_STOR_VOL + ">"); and

55) ps.println("</" + getName() + ">");.

```

See https://community.cablelabs.com/svn/OCAPRI/tags/RI_I1_1_3_REL_B/ri/ODLSrc/OCAP-1.0/java/src/hn/org/cablelabs/impl/ocap/hn/contentdatabase/VideoItem.java.

RELIEF WARRANTED FOR INFRINGEMENT OF U.S. PATENT 8,713,425

112. Defendant Comcast's infringing activity alleged above comprises the compelling reason

Comcast's cable television service and product is acquired in the consumer marketplace.

Likewise, Defendant NBCU's infringing activity alleged above comprises the compelling reason NBCU's service is acquired in the consumer marketplace.

113. Defendant Comcast's infringing activity alleged above creates a performance advantage

in Comcast's cable television networks that drives demand for respective cable television service and customer premises equipment. In similar manner, Defendant NBCU's

infringing activity alleged above creates a performance advantage in NBCU's service markets that drives demand for NBCU's service. There is no acceptable non-infringing

substitute in Defendant Comcast's cable television system for said infringing activity

alleged above. Neither is there an acceptable non-infringing substitute in Defendant

NBCU's service markets for said infringing activity alleged above.

114. Progme has no adequate remedy at law against Defendant Comcast's acts of infringement

and, unless Defendant Comcast is enjoined from continuing to infringe the '425 Patent,

Progme will suffer irreparable harm. Likewise, Progme has no adequate remedy at law

against Defendant NBCU's acts of infringement and, unless Defendant NBCU is enjoined

from continuing to infringe the '425 Patent, Progme will suffer irreparable harm.

115. Defendants Comcast and NBCU had prior constructive knowledge of the '425 Patent as

indicated in **Exhibit C**, the patent number "**Patent 8,713,425**" marked on the PrintHD.TV

home page (located at www.printhd.tv) web page, labelling at the bottom of the page on

5/27/14, to provide constructive notice thereof pursuant to 35 U.S.C. § 287.

116. Progme has at all times complied with 35 U.S.C. § 287, providing Defendants Comcast and NBCU with prior constructive notice, which constituted consistent and continuous notice of the '425 Patent being infringed by Defendants Comcast and NBCU.

117. This Complaint asserts patent infringement of only one or more of the method claims of the '425 Patent, not the one or more of the apparatus claims of the '425 Patent.

118. The method of generating and encoding the hyperlink address string structured as a PrintWriter method claimed in the '425 Patent and alleged infringed herein is capable of being produced in a physical device, a web page, for constructive notice by marking pursuant to 35 U.S.C. § 287.

119. Defendants Comcast and NBCU received actual notice thereof from service of the original complaint on their parent Comcast Corporation on or about 11/16/15.

120. Defendants Comcast and NBCU received actual notice thereof from service of Progme's

**NOTICE OF DISMISSAL OF DEFENDANTS AND ACTION AGAINST
DEFENDANTS PURSUANT TO FRCP 41(a)(1)(A)(i) on 11/25/15.**

121. In addition, Defendants Comcast and NBCU received actual notice thereof from service of this Amended Complaint.

122. As a result of Defendants Comcast and NBCU's acts of infringement, Progme has suffered and will continue to suffer damages in an amount to be proved at trial. Pursuant to 35 U.S.C § 284, Progme is entitled to adequate damages to compensate for infringement including a reasonable royalty from the date of Defendants' respective notice of the '425 Patent. Progme has no means of ascertaining the full extent of Defendants' respective infringement of the '425 Patent and the amount of Progme's damages resulting

from said infringement except through the production of evidence thereof in Defendants' respective sole possession and control.

PRAYER FOR RELIEF

123. WHEREFORE, Progme prays for the following relief:

- a. A judgment in favor of Progme that Defendants Comcast and NBCU each has infringed, directly and indirectly by way of inducement and/or contributory infringement, literally and/or under the doctrine of equivalents, at least one claim of the '425 Patent;
- b. A permanent injunction enjoining Defendants Comcast and NBCU and their respective officers, directors, agents, servants, employees, affiliates, divisions, branches, subsidiaries, parents, and all others acting in concert or privity with any of them from infringing, inducing the infringement of, or contributing to the infringement of the '425 Patent;
- c. Award to Progme the damages to which it is entitled by law and under 35 U.S.C. § 284 for Defendants Comcast and NBCU's past infringement and any continuing or future infringement up until the date Defendants Comcast and NBCU are each finally and permanently enjoined from further infringement, including both compensatory damages and treble damages for willful infringement;
- d. A finding that this is an "exceptional action" and a judgment and order requiring Defendants to pay the costs of this action (including all disbursements) as well as attorneys' fees as provided by 35 U.S.C. § 285;

- e. Award to Progme pre-judgment and post-judgment interest on its damages and
- f. Such other further relief in law or equity to which Progme may be justly entitled.

DEMAND FOR JURY TRIAL

124. Pursuant to Rule 38 of the Federal Rules of Civil Procedure, Progme hereby demands a trial by jury as to all issues so triable.

Date: Febuary 17, 2016

Respectfully submitted,

/s/ David A. Reams

David A. Reams

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P # 62855

CERTIFICATE OF SERVICE

I hereby certify that on this 17th day of Febuary, 2016, I electronically filed the foregoing paper with the Clerk of Court using the ECF system which will send notification of such filing to all counsel of record.

Signed,

/s/ David A. Reams

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P # 62855

**IN THE UNITED STATES DISTRICT COURT
FOR THE EASTERN DISTRICT OF MICHIGAN
SOUTHERN DIVISION**

INDEX OF EXHIBITS

<u>EXHIBIT</u>	<u>DESCRIPTION</u>
A	U.S. Patent No. 8,713,425
B	USPTO NOTICE OF RECORDATION OF ASSIGNMENT DOCUMENT
C	Patent Constructive Notice By Marking (35 U.S.C. § 287)



US008713425B2

Exhibit A

(12) **United States Patent**
Reams

(10) **Patent No.:** **US 8,713,425 B2**
(45) **Date of Patent:** **Apr. 29, 2014**

(54) **AUDIO/VIDEO PROGRAM-RELATED
HYPERLINK PRINTER**

(75) **Inventor:** **David Anthony Reams**, Rochester Hills,
MI (US)

(73) **Assignee:** **Progme Corporation**, Rochester Hills,
MI (US)

(*) **Notice:** Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 1079 days.

(21) **Appl. No.:** **12/687,945**

(22) **Filed:** **Jan. 15, 2010**

(65) **Prior Publication Data**
US 2010/0146376 A1 Jun. 10, 2010

Related U.S. Application Data

(63) Continuation-in-part of application No. 11/318,713,
filed on Dec. 27, 2005, now abandoned, which is a
continuation-in-part of application No. 09/839,074,
filed on Apr. 20, 2001, now abandoned.

(51) **Int. Cl.**
G06F 3/00 (2006.01)

(52) **U.S. Cl.**
USPC 715/234

(58) **Field of Classification Search**
USPC 715/208, 234, 243, 254, 255, 273, 274
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

6,415,438 B1 *	7/2002	Blacketter et al.	725/136
6,507,410 B1 *	1/2003	Robertson et al.	358/1.18
6,795,973 B1 *	9/2004	Estipona	725/136
2002/0056091 A1 *	5/2002	Bala et al.	725/34
2003/0023971 A1 *	1/2003	Martinolich et al.	725/32

OTHER PUBLICATIONS

"Class PrintWriter" <available from: <http://docs.oracle.com/javase/6/docs/api/java/io/PrintWriter.html>>, pp. 1-19.*

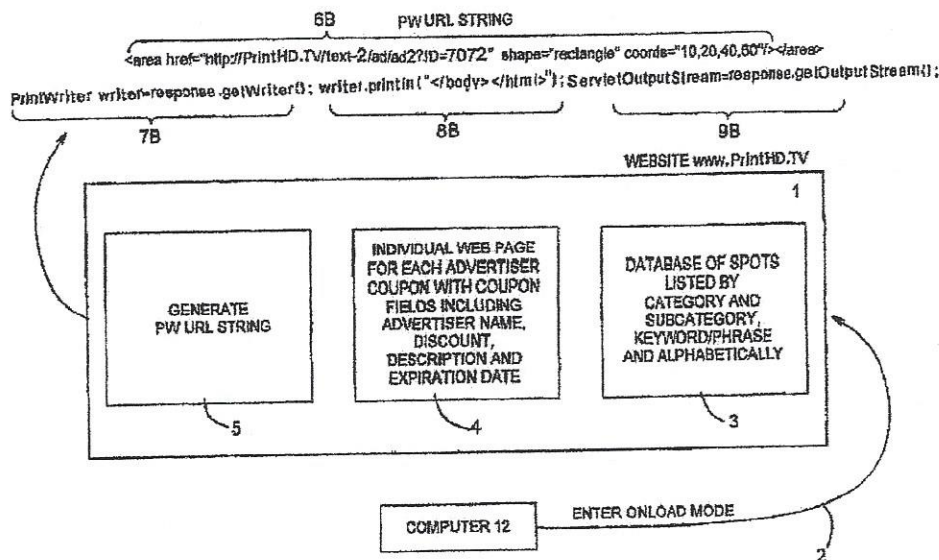
* cited by examiner

Primary Examiner — Kyle Stork

(57) **ABSTRACT**

A system is disclosed for hyperlinking to hyperlinked content corresponding to program material wherein the hyperlinking prints only pre-defined printable output of the hyperlinked content comprising a generator for generating a hyperlink address string associated with the program material including a first attribute indicating a hyperlink address to the hyperlinked content and a second attribute indicating one or more parameters defining the pre-defined printable output of the hyperlinked content, an encoder for encoding the hyperlink address string for transmission via a program signal transmitter, the program signal transmitter for transmitting the hyperlink address string, a program signal receiver for receiving the hyperlink address string, a data processor for processing the hyperlink address string for hyperlinking to the hyperlinked content printing only the pre-defined printable output of the hyperlinked content and a web browser for hyperlinking to the hyperlinked content printing only the pre-defined printable output of the hyperlinked content.

25 Claims, 3 Drawing Sheets



U.S. Patent

Apr. 29, 2014

Sheet 1 of 3

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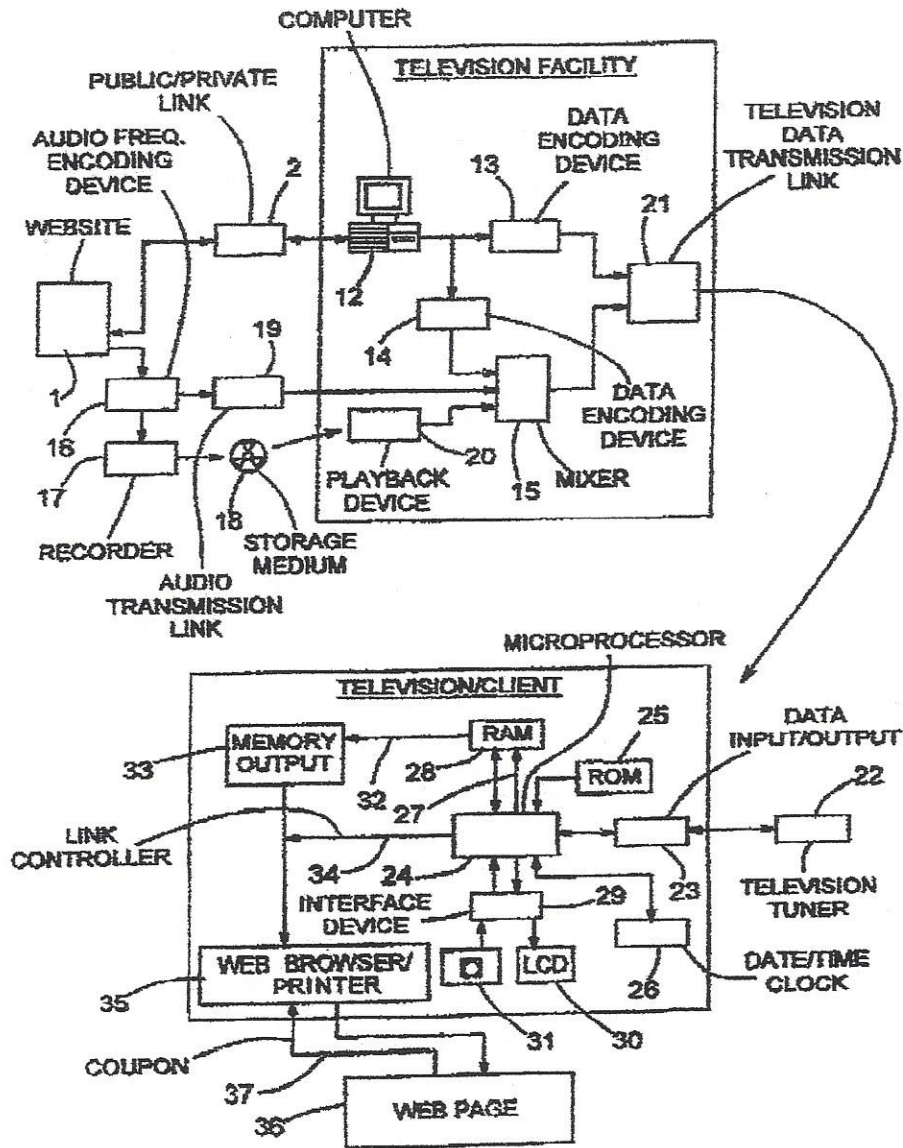
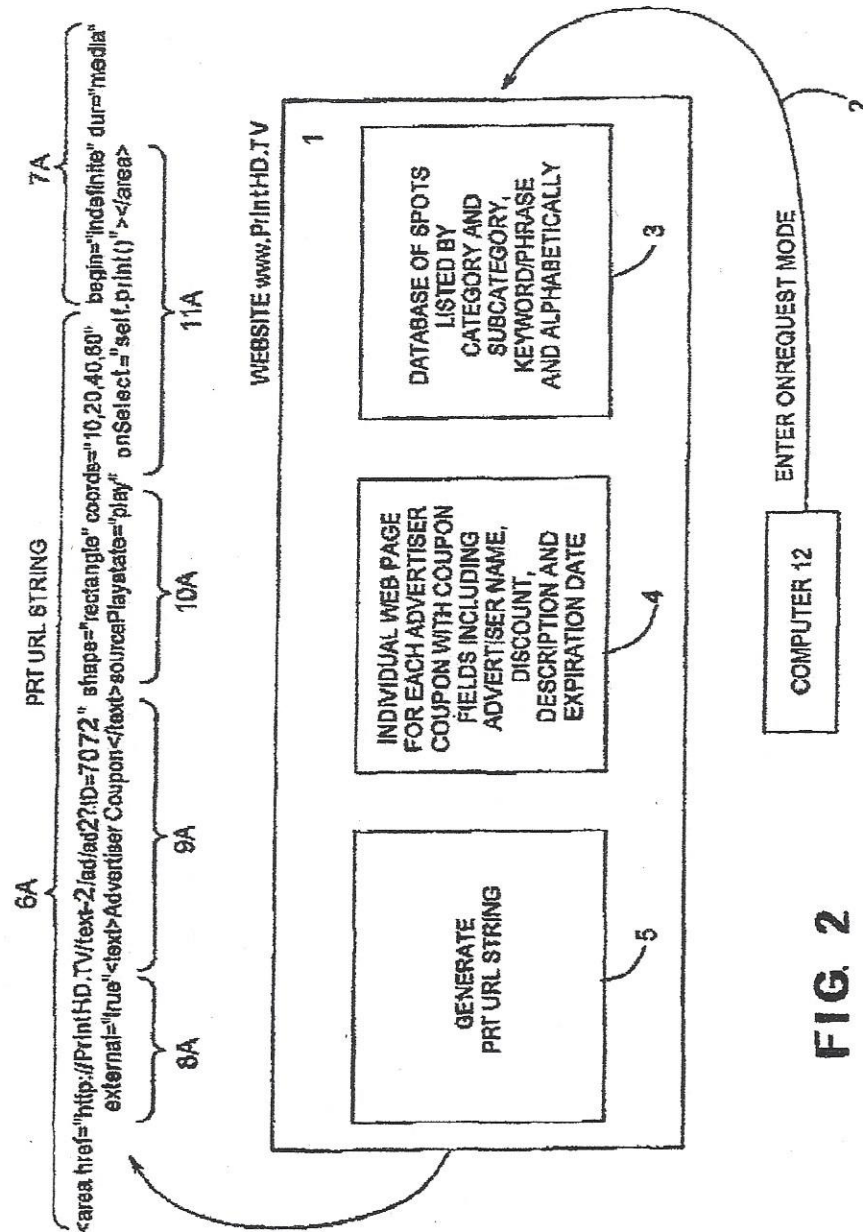


FIG 1



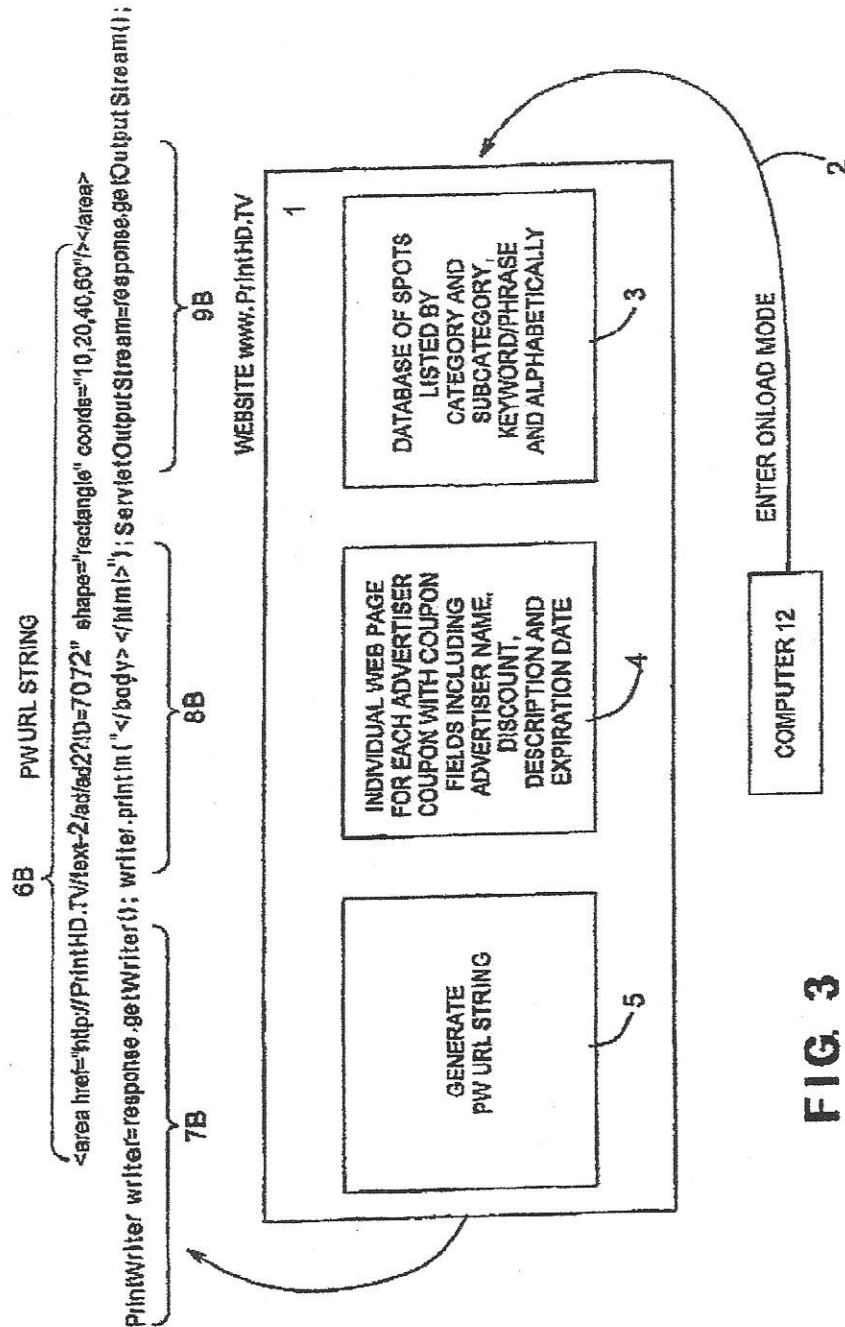


FIG. 3

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AUDIO/VIDEO PROGRAM-RELATED
HYPERLINK PRINTERCROSS REFERENCE TO RELATED
APPLICATIONS

This application is a continuation-in-part application of U.S. patent application Ser. No. 11/318,713 filed Dec. 27, 2005, now abandoned, which was a continuation-in-part application of U.S. patent application Ser. No. 09/839,074 filed Apr. 20, 2001, now abandoned, the disclosure of which applications is incorporated herein by reference.

BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to the field of hyperlinking to and printing hyperlinked content corresponding to radio or television program material. In particular, the invention relates to the field of hyperlinking to hyperlinked content corresponding to radio or television program material wherein the hyperlinking prints only pre-defined printable output of the hyperlinked content corresponding to the radio or television program material.

2. Description of the Related Art

Radio and television programs often broadcast content that is available to be hyperlinked to during the program. Prior art systems teach hyperlinking to content related to program material such as a coupon during an advertisement. Blacketter (U.S. Pat. No. 6,415,438); Estipona (U.S. Pat. No. 6,795,973); Bala, et al (US 20020056091).

Content hyperlinked to in said prior art systems is generally content that is printable. Adding printing utility to said prior art systems, however, would require adding print activation means on top of the existing hyperlink activation means in said prior art systems. It would be beneficial to combine activation of hyperlinking with activation of printing so that only one activation is required to activate both hyperlinking to and printing program-related content.

In addition, the portion of such content desirable for printing is typically less than the entire portion of the hyperlinked content. Consequently, said prior art systems teach against hyperlinking to said hyperlinked content wherein said hyperlinking prints pre-defined printable output of said predetermined hyperlinked content.

SUMMARY AND OBJECTS OF THE
INVENTION

The invention integrates hyperlinking to and printing program-related content so that hyperlinking to the content prints the content. Specifically in the invention, hyperlinking to predetermined hyperlinked content corresponding to predetermined program material prints predetermined printable output of said predetermined hyperlinked content.

One object of the invention is to integrate hyperlinking to and printing hyperlinked content related to program material.

Another object of the invention is to combine in the same hyperlink address string hyperlinking attributes and values and printing attributes and values.

Yet another object of the invention is to enable hyperlinking to predetermined hyperlinked content corresponding to predetermined program material to print pre-defined printable output of said predetermined hyperlinked content.

Additional objects will be apparent from the following detailed description.

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BRIEF DESCRIPTION OF THE DRAWINGS

The features and advantages of the present invention can be understood by reference to the detailed description of the preferred embodiments set forth below taken with the drawings, in which:

FIG. 1 is the system of the present invention.

FIG. 2 shows one hyperlink address string that may be generated by the present invention.

FIG. 3 shows another hyperlink address string that may be generated by the present invention.

DETAILED DESCRIPTION OF EXEMPLARY
EMBODIMENTS OF THE INVENTION

"Program material" as used herein may be audio or video commercial, sports, news, entertainment or non-commercial program material. The term "coupon" is defined herein expansively as in Engel, et al, U.S. Pat. No. 5,907,830, which is incorporated herein by reference, to include any printable certificate used to obtain anything of interest to a potential consumer such as special pricing, a discount, money, samples or additional product, premiums, rebates or any other thing of value or interest. Other printable content that may be related to program material and printed out in the instant invention may be other supplemental information related to commercials, additional audio sound tracks or additional visual information including information about the characters, storylines and background information related to the program, close-ups of specific items within the program material, alternative camera angles for video program material, alternative scenes and dialogue for characters, image triggers tied to particular images on screen such as a individual's face, articles of clothing or a can of soda linking to a web page containing information about an associated product or service and interactive prompts/sequences for the viewer to select.

The term "hyperlink", as used herein, includes a link to retrieve and render Internet or locally stored content such as text, graphics, sound, video or images. Hyperlinking behavior may be described as "seeking" the document wherein seeking in this sense means to advance the document timeline to the specified time as specified in <http://www.w3.org/TR/2001/REC-smil-animation-20010904/>, which is incorporated herein by reference. Said hyperlinking may require one or more user agents including a browser application and, to retrieve and render SVG content, an SVG user agent as specified in <http://www.w3.org/TR/SVG/intro.html#Terminology>, which is incorporated herein by reference. In addition, said hyperlinking may be activated in the instant invention by an actuate attribute or timing instructions contained in a timing attribute such as begin, dur, end, restart, repeatcount, repeatdur and fill or an event attribute without any actuate attribute. Said begin timing attribute may define when an element becomes active and said event attribute may have a value describing the event and an optional offset (for example, to account for any transmission time taken to fetch the content via hyperlink) that determine element begin time, any event being an user-interface event, an event trigger transmitted with the program signal or any other event specified in <http://www.w3.org/TR/DOM-Level-2-Events/events.html#Events-eventgroupings->, which is incorporated herein by reference. Further, the instant invention support interactive timing of animation elements to allow the author to specify that an animation should begin or end in response to an event (such as an user-input event like "click"), another hyperlink activation or a DOM method call to begin or end

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animation using the special value "indefinite" as specified in <http://www.w3.org/TR/2001/REC-smil-animation-20010904/>.

The pre-defined printable output of the predetermined hyperlinked content may comprise a multimedia document with at least one of the following components: text, image, animation, video, streaming video or audio converted to image or text. Said pre-defined printable output of said predetermined hyperlinked content may be printed out to paper or file.

The invention disclosed herein comprises a computer-implemented system for hyperlinking to predetermined hyperlinked content corresponding to predetermined program material wherein said hyperlinking prints only pre-defined printable output of said predetermined hyperlinked content comprising: means for generating a hyperlink address string including a first attribute indicating a predetermined hyperlink address to said predetermined hyperlinked content corresponding to said predetermined program material and a second attribute indicating one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content; means for encoding operably coupled to said means for generating for encoding said hyperlink address string for transmission via means for transmitting program signals; said means for transmitting program signals operably coupled to said means for encoding for transmitting said hyperlink address string to means for receiving program signals; said means for receiving program signals for receiving said hyperlink address string; means for processing operably coupled to said means for receiving program signals for hyperlinking to said predetermined hyperlinked content printing only said pre-defined printable output of said predetermined hyperlinked content: A) processing said predetermined hyperlink address indicated in said first attribute to hyperlink to said predetermined hyperlinked content and B) processing said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content indicated in said second attribute for said hyperlinking to said predetermined hyperlinked content printing only said pre-defined printable output of said predetermined hyperlinked content and means for hyperlinking operably coupled to said means for processing for hyperlinking to said predetermined hyperlinked content wherein said hyperlinking to said predetermined hyperlinked content prints only said pre-defined printable output of said predetermined hyperlinked content according to said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content indicated in said second attribute. Said hyperlink address string may include one or more additional attributes indicating a spatial, temporal and/or an interactive aspect of said hyperlinking.

In one embodiment herein, said second attribute indicating at least one parameter defining said pre-defined printable output of said predetermined hyperlinked content may indicate a descriptor, Digital_Copy_Control_Descriptor, authorizing the printing of at least one copy of said pre-defined printable output (for example, copy one only "10"). If indicated, such descriptor may be included in at least one program table, e.g. EIT, PMT or SDT, transmitted in the transport stream.

Referring to the Drawing FIG. 2, TELEVISION FACILITY COMPUTER 12 may access WEBSITE 1 via PUBLIC/PRIVATE LINK 2, which may be the public switched telephone network, an integrated digital network or similar wire or wireless facility, to encode an advertisement with an URL string including an URL to a web page having at least one

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coupon related to said advertisement. While the Drawing and system description herein are substantially specific to television facilities, it is understood that such specification is for illustrative purposes only and the Drawing and system description apply equally to broadcast, cable, satellite and Internet television and radio facilities and any video or audio recording medium.

Via WEBSITE 1 data entering means TELEVISION FACILITY may search DATABASE 3 of advertisements ("spots") and associated URLs to coupon web pages (each located as INDIVIDUAL WEB PAGE 4 at WEBSITE 1 or at the advertiser website) to select a spot scheduled to be advertised. Said spots and associated URLs may be listed in DATABASE 3 by predetermined category such as media market and predetermined subcategory such as product/service, key word/phrase and alphabetically. When a spot is selected, the associated URL to the web page having at least one advertiser coupon may be automatically entered in said URL string and the text "[Advertiser Name] Coupon", using the selected advertiser name, may be automatically generated in said URL string as text identifying said at least one coupon related to said advertisement. TELEVISION FACILITY may alternatively directly enter via said data entering means a spot of interest and/or an associated URL to a web page having at least one advertiser coupon and said text identifying said at least one coupon related to said advertisement without selecting said spot from DATABASE 3.

Referring to the Drawings FIG. 2 and FIG. 3, said system may further include the step of entering 2 via data entering means to database means operably coupled to said generating means: said predetermined hyperlink address and predetermined hyperlink activation data for said user-activated, ONREQUEST, or automatically, ONLOAD, activating said hyperlink to said predetermined hyperlinked content including: predetermined user-activation data for said user-activating said hyperlink or predetermined automatic activation data for said automatically activating said hyperlink.

The URL STRING described herein may utilize the international Synchronized Multimedia Integration Language (SMIL) standard specified in <http://www.w3.org/TR/SMIL2/>, which is incorporated herein by reference. SMIL is an XML-based language, a "presentation description language", that allows authors to write interactive multimedia presentations. While one embodiment of the invention is described utilizing the SMIL format, the media objects may be implemented in any other format such as any JPEG format, any Graphics Interchange Format (GIF), audio or digital audio formats, Audio IFF, Computer Graphics Metafile, TIFF, BIFF, bmp, Clear, FITS, NFF, OFF, PCX, PNG, TGA, XBM, mod, any Moving Picture Experts Group (MPEG) format, Musical Instrument Digital Interface, PICT, PNG, Portable Document Format (PDF), Portable Network Graphics, Portable Pixmap, progressive coding, Quicktime, RIFF, Self Extracting Archive, sequential coding; server-parsed HTML, sprite, Tagged Image File Format, targa, Targa Graphics Adaptor, thumbnail, way, WebCGM, wireless bitmap, xpm or a different frame rate video.

Using SMIL, an author can describe the temporal behavior of a multimedia presentation, associate hyperlinks with multimedia objects and describe the layout of the presentation on a screen. Further, using SMIL media components may be named for text, images, audio and video with URL's to schedule their presentation either in parallel or in sequence. The presentation may be composed of several components that are accessible via the URL's, e.g. files stored on a web server, each having a different media type such as audio, video, image or text with the begin and end times of different com-

ponents specified relative to events in other media components and the presentation links to components via hyperlinks. Supplemental multimedia information may also be accessed via hyperlinks to locally stored files which may have been pre-fetched and are stored at lid URL addresses. In addition to HDTV, High Definition (HD) Radio may use SMIL for multimedia encoding, transmission and receiver processing pursuant to http://www.ibequity.com/technology/documents/SY_AAS.sub.—5033.sub.—002.—pdf, the HD Radio-SMIL specification.

I. Generating and Transmitting Hyperlink Address String

The invention includes a method of generating a hyperlink address string for hyperlinking to predetermined hyperlinked content corresponding to predetermined program material wherein said hyperlinking prints only pre-defined printable output of said predetermined hyperlinked content including the step of: generating via means for generating an hyperlink address string including a first attribute indicating a predetermined hyperlink address to said predetermined hyperlinked content corresponding to said predetermined program material and a second attribute indicating one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content. Said method may further include entering via means for entering said predetermined hyperlink address and/or said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content to means for storing data operably coupled to said means for generating. Said means for generating may comprise computer means, either a website or receiver computer means. Said hyperlink address string may comprise a character string and said predetermined hyperlink address comprises an URL. Said method may further include the step of encoding said hyperlink address string for transmission in conjunction with program signals representative of said predetermined program material.

URL <a or <area href/shape and coords attributes. The URLs may be a simple identifier or several lines of text characters to specify the actual address of URL addressable content, either local or interne. The href portion of this attribute comprises the first attribute in the hyperlink address string of the invention including the predetermined hyperlink address to the predetermined hyperlinked content. To enter the appropriate href attribute, an advertiser may first select the media being used to transmit the spot, HD Radio <a href, HDTV <area href or Media Player Audio <a href or Video <area href. The value of the href attribute the URL of the link's destination, may be automatically entered in SMIL URL STRING once entered as an advertiser's URL to WEB PAGE 36. While the <a href element associates a link, href attribute, with a complete media object, the <area href element using the shape and coords attributes associates the link with spatial portion(s) of an object's visual display. In addition, the area element allows breaking up an object into temporal subparts using begin and end attributes. Area (and a) element attributes include actuate, shape, coords, href, begin, end, dur, sourcePlaystate and external. Pursuant to said HD Radio-SMIL specification, HD Radio is to utilize only the <a href element to reference an URL link because the <area> element implies a display which can be partitioned. Since there is no shape or coords attributes associated with the <a href URL attribute, the shape and coords attributes are not included in the SMIL URL String <a href attribute. In said predetermined hyperlink address the shape attribute specifies the shape of the hyperlink display with the values of rectangle shape="rectangle", circle shape="circle" or polygon shape="polygon". The coords attribute specifies the relative

position of the hyperlink display on the screen and include the following values: coords="0,0,50,50" (Upper Left), coords="50,0,100,50" (Upper Right), coords="0,50,50,100" (Lower Left), coords="50,50,100,100" (Lower Right), coords="25,25,75,75" (Center) and coords="10,20,40,60" (Lower Center).

Said hyperlink address string may further comprise a third attribute indicating predetermined hyperlink activation for hyperlinking to said predetermined hyperlinked content wherein printing said pre-defined printable output of said predetermined hyperlinked content is activated by said activation of hyperlinking to said predetermined hyperlinked content. Said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content may comprise at least one parameter specifying a predetermined spatial or temporal aspect of said predetermined hyperlinked content.

Timing attributes begin, end and dur. To enter the appropriate timing attributes, an advertiser may enter 2 to DATABASE OF SPOTS LISTED BY CATEGORY AND SUB-CATEGORY, KEYWORD/PHRASE AND ALPHABETICALLY 3 the desired URL hyperlink activation mode, user-activated (ONREQUEST) begin="indefinite" dur="media" 7A or automatically activated (ONLOAD) begin="dd:hh:mm:ss.0.sup.1-n" and end="dd:hh:mm:ss.0.sup.1-n" (NOT SHOWN), day, hour, month, second, fraction of second start/end times scheduled, for example, in 1-n spots in an advertising campaign. The value of "indefinite" for the begin attribute signals that the beginning of the element is determined by user hyperlink activation during the playing of associated program material and the dur attribute value of "media" (the "dur" is the media duration). Another value for the dur attribute may be a clock value. If there is more than one begin and end value, such as to specify the start and end date/times in several spots scheduled to run in a television or radio advertising campaign, the next begin time is always the earliest begin time after the current time as determined by SMIL player clock and each respective begin and end value is separated by a semi-colon (;). Time values to begin and to end are relative to the beginning of the associated media object, i.e. television spot having related coupon web page for viewers to access. There is no need for month and year date codes in the begin and end time attributes because, since the time is measured from the most recent time as determined by SMIL player clock, the month and year can be determined from the clock internally.

Timing attributes and timeline data structure used in SMIL for hyperlinking to predetermined printable content related to predetermined program material is also used in the invention for printing of said content. For example, an advertiser may specify that hyperlinking to and printing a spot-related coupon only take place while the ad is playing, e.g. between the SMIL begin and end or par values, or even immediately after the ad plays, e.g. pursuant to the SMIL seq time value. The SMIL dur value indicating the time value an object is to remain active could also indicate the same value for object printing. SMIL repeatCount and repeatdur indicating respectively the number of time and total amount of time an object will repeat could apply equally to object printing.

External/Internal attribute. The internal attribute defines whether or not the link destination is opened by a current or an external application, defining whether or not the hyperlink is to another node in the same SMIL presentation or local memory with values of true or false, for example internal="true" &A. In one embodiment disclosed herein, the apparatus may have a local, e.g. lid URL, hyperlink only so that apparatus does not comprise Internet web browser means

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and web page content may be transmitted in hyperlink address string or in advance of the hyperlink address string transmission ("prefetched") via the SMIL Prefetch Element (using the mediaSize attribute to define a relative amount of the object to prefetch, mediaTime attribute to define a relative amount of time to dedicate to prefetching and a bandwidth attribute defining the relative amount of bandwidth to dedicate to prefetching).

Actuate attribute. The URL hyperlink activation mode may be selected and entered 2 as either user-activated (ONREQUEST) or automatically activated (ONLOAD). If the ONREQUEST (user-activated) hyperlink activation mode is entered, which may be the default value for this attribute, the value of the actuate attribute may be <text> Advertiser Coupon</text> 9A or, if the ONLOAD (automatic) hyperlink activation mode is entered, the value may be actuate="on Load" (NOT SHOWN). The Company Name text may be automatically entered in the URL STRING text field upon user selection of the ONREQUEST hyperlink activation mode. Further, the attribute value actuate="on Load" (NOT SHOWN) may be automatically entered in the URL STRING upon user selection of the ONLOAD hyperlink activation mode. Unless actuate="on Load" (NOT SHOWN) is entered, the default value for the actuate attribute may be actuate="on Request", which on Request value as the default does not need to be specified expressly to indirectly specify or indicate user-activated hyperlink activation and instead <text> Advertiser Coupon</text> 9A may be entered to display text to prompt user hyperlink activation, for example for ONREQUEST <text> Advertiser Coupon</text> 9A and for ONLOAD actuate="on Load" (NOT SHOWN).

SourcePlaystate attribute. The sourcePlaystate attribute controls temporal behavior of the presentation containing the link when traversed. This attribute has 3 possible values: play, indicating when the link is traversed, the presentation containing the link continues playing; pause, when the link is traversed, the presentation containing the link pauses (to resume playing when the resource is completed) or stop when the link is traversed, the presentation containing the link stops without any resumption. An example of this attribute is sourcePlaystate="play" 10A.

In one preferred embodiment disclosed herein said data entering means and generating means may comprise website means or other database means, i.e. WEBSITE 1. In addition to web utility, the instant invention enables receivers such as STB receivers to generate code for Java TV applications. The description of the invention using website means for generating the hyperlink address string applies equally to the receiver generating the code.

Referring to FIG. 1, WEBSITE 1 may then output a generated URL string to either AUDIO FREQUENCY ENCODING DEVICE 16 to encode said URL string for transmission via program audio channel data transmission means or download said URL string to program signal transmitting means. AUDIO FREQUENCY ENCODING DEVICE 16 may inaudibly embed said URL string in the program audio itself. Audio frequency encoded data signals may then be fed from AUDIO FREQUENCY ENCODING DEVICE 16 to RECORDER 17 and onto STORAGE MEDIUM 18, or, alternatively, sent through AUDIO TRANSMISSION LINK 19 (such as a network program distribution system) to MIXER 15 located at TELEVISION FACILITY to be mixed in with program audio signals. STORAGE MEDIUM 18 may be sent to TELEVISION FACILITY for later playback via PLAYBACK DEVICE 20. Said URL string may be downloaded via PUBLIC/PRIVATE LINK 4 to TELEVISION FACILITY to be processed and transmitted via TELEVISION DATA

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TRANSMISSION LINK 21 at appropriate times in conjunction with transmission of associated program signals. Downloaded via PUBLIC/PRIVATE LINK 4, COMPUTER 12 may then output said URL string to DATA ENCODING DEVICE 13 to encode said URL string for transmission via conventional program data channel means such as VBI, MPEG, subcarrier, etc. In the alternative, COMPUTER 12 may output said URL string to DATA ENCODING DEVICE 14 to encode said URL string for transmission via program audio channel means (i.e. embedding in program audio signals via MIXER 15).

Said URL string may be generated for transmission via dtvcc, using the same television transmit channel used for closed captioning, thereby making said URLs available virtually everywhere television programming is received and enabling the use of closed captioning tools to encode and broadcast the URLs. Preferably, however, said URL string may be transmitted via data packets in transport streams and, in the HDTV embodiment of the invention, the hyperlink address string is transmitted via ancillary data packets transmitted in a transport stream with corresponding program material.

II. Apparatus

The apparatus claimed herein is tied to and dependant upon said data entering means and generating means. Indeed, said apparatus is dependant on said data entering and generating means to receive the first and second attributes included in the hyperlink address string for hyperlinking and printing pre-defined printable output of predetermined hyperlinked content.

The program signal receiver apparatus of the invention is for hyperlinking to predetermined hyperlinked content corresponding to predetermined program material wherein said hyperlinking prints only pre-defined printable output of said predetermined hyperlinked content comprising: means for receiving program signals for receiving a hyperlink address string including a first attribute indicating a predetermined hyperlink address to said predetermined hyperlinked content corresponding to said predetermined program material and a second attribute indicating one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content; means for processing operably coupled to said means for receiving program signals for hyperlinking to said predetermined hyperlinked content printing only said pre-defined printable output of said predetermined hyperlinked content: A) processing said predetermined hyperlink address indicated in said first attribute to hyperlink to said predetermined hyperlinked content and B) processing said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content indicated in said second attribute for said hyperlinking to said predetermined hyperlinked content printing only said pre-defined printable output of said predetermined hyperlinked content and means for hyperlinking operably coupled to said means for processing for hyperlinking to said predetermined hyperlinked content wherein said hyperlinking to said predetermined hyperlinked content prints only said pre-defined printable output of said predetermined hyperlinked content according to said one or a plurality of predetermined parameters defining said pre-defined printable output of said predetermined hyperlinked content indicated in said second attribute.

The program signal receiver apparatus may comprise a television receiver apparatus, a radio receiver apparatus and/or a media player apparatus. The means for receiving program signals within said program signal receiver apparatus may comprise tuner means.